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THE PEDAGOGICAL SEMINARY

A QUARTERLY

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EDITED BY

G. STANLEY HALL
President of Clark University and Professor of Psychology and Education

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THE
PEDAGOGICAL SEMINARY

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A CHILD'S VOCABULARY

By MATTHIAS R. HEILIG, Dansville, New York

Our daughter Alice's vocabulary of 2,153 words represents very nearly her actual knowledge of language; for we began at her second year to keep record of her words, and after many revisions and a comparison with a long list published in THE PEDAGOGICAL SEMINARY, we are not conscious of having missed many words that she has used intelligently. On the very first day of keeping the record we got 355. Alice was then twenty-three months old. On her second birthday the number was 455; and it grew at the rate of about 100 per month, until the twenty-seventh, twenty-eighth and twenty-ninth months, when our viligance lapsed. So that at two and a half years her vocabulary was but 1,111. We began the search with new interest and amazing success during the thirty-first, thirty-second, thirty-third and thirty-fourth months; having at that time a published child's vocabulary for comparison. On the day before her third birthday we thought we had 2,106 words; but upon recount found the correct total to be 2,153.

During the last three months we tested her knowledge of words about which we were doubtful by asking her to give their definitions, a thing she likes to do, and often asks to be given a chance to do.

We adopted Prof. Whipple's method of counting the past tense and participle forms of verbs as distinct words. However I observed that toward the last she would use the present progressive form of even the latest verb she had learned; that is she seemed to know that "ing" put on any word of action expressed a continuing of the action.

Alice knows no Mother Goose stuff. All her words are real words; and she got them all by hearing her parents use them. She is an only child; and has had very little companionship of her own age. Other development has kept pace with her mental progress. At three she is able to dress herself, except to button shoes and tie strings. She has learned more about music than we thought possible for one of her age. We attribute this to the fact that her mother has been teaching *beginners,* whose exercises, being the very simplest both to remember and reproduce, interested her as soon as she could make her fingers obey her desires. So that she not only likes to hear the heavier classics, but takes pleasure in scales, simple chords, arpeggios and simple exercises. I believe musical talent could be brought out earlier and better if the very fundamentals, the simplest forms, were heard by the child first, instead of involved harmonies.

Following are some notes we have prepared for Alice's 1912 diary, concerning her musical attainments. All of her musical knowledge she has gained by hearing her mother play or teach beginners. No attempt has ever been made to teach her anything; but of course all her questions were answered. At thirteen months she sang the first four tones of the scale alone and unprompted. At fourteen months she sang the whole scale with absolute accuracy, alone and unprompted. From the fourteenth month she could strike at once with her voice any tone sounded on the piano. At fourteen months five days, she was evidently pleased by the playing of the violin and piano by her parents. Having been told, whenever she sang a scale, what it was, she was able to sing it upon request at fifteen months two days. During the fourteenth and fifteenth months she sang various intervals, some original, some imitated, while she played with her toys. At fifteen months sixteen days she was able to sing alone the first phrase of the hymn meter "Greenville," to which her grandmother used to put the words: Bye Bye Baby. At fifteen months twenty-one days she sang the scale descending as well as ascending. About this time she learned to sing an eighth, and to identify it as an octave, often singing "oc" on the lower note and "tave" on the eighth above. Before her twentieth month she sang the *intervals* both ascending and descending,—that is, do-re, do-mi, do-fa, etc.,—using the syllable "la" for each tone.

At her twenty-first month she could sing alone seven songs (not the words, but the tune, using "la la"). They were: "Here's a Ball for Baby;" "Baby is Going to Bye-lo-Land;" "Bed in Summer;" "Greenville" (entire); "Father, we

Thank Thee for the Night;" "Clap, Clap Your Hands;" "Jesus Bids Us Shine." At twenty-third month she began sitting (for half an hour at a time) at the piano, playing scales up and down, and experimenting in striking chords which manifestly pleased her when in harmony. By twenty-fifth month she had learned both the words and the tunes of ten kindergarten songs and three other Sunday school songs;—though she'd rarely go all the way through a song at one singing. At twenty-seventh month sixth day, she struck a chord of three in the right hand and ran up and down a correct rhythm with her left. At this period she began to call the attention of her parents to pleasing (harmonious major or minor) chords when she found them. She used her own fingering; but by her third year, got a perfect legato, an accent, strong touch, always a rhythm, and the use of *all* her fingers.

Before her thirtieth month she learned by herself to start from "C" and to run the scales in thirds or sixths or octaves, on the piano. Other intervals seemed not to please her. Before her twenty-ninth month, she sang (with the syllable "la") the intervals, do, mi, sol, do; 1, 3, 5, 8; and backward: do, sol, mi, do; 8, 5, 3, 1. By her third year she knew this to be an arpeggio. Just before her third birthday she picked out by herself the first four measures (two phrases) of "Greenville," with one hand or in octaves or thirds, on the piano, using all fingers. Also, a simple Czerny study of two phrases, which she often heard played by a scholar. At this time she began to play a trill. At thirty months, if asked, "Who plays this tune?" upon hearing it, she could associate it at once with the person whom she had heard play it. She began this at twenty-five months.

Almost from the very beginning of her singing, if she found she was too low or too high for her register, she'd jump up or drop down an octave, without losing a beat, and hit the note exactly. She has the sharpest ear possible; and has never been known to sing a shadow flat or sharp.

Terms used and understood at the third year were: Arpeggio, chord, intervals, notes, octave, scale, sharps (as the black keys), thirds, trill, bass.

VOCABULARY OF ALICE HEILIG, 2153 WORDS ON HER THIRD BIRTHDAY

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peach
peanut
peanutbutter
pear
peas
pebble
peek-a-boo
peg
peg-board
pen, cage
pen, to write
pencil
penny
people
peppermint
pepper
perhaps
perfectly
perspiration
perspire
petticoat
Philadelphia
phonograph
piano
pick
picked
picking
picnic
picture
pie
piece
piggie-back
pile
pillow
pimple
pinch
pinched
pinching
pin-cushion
pin, n
pin, v
pinned
pinning
pine-pillow
pink
pipe
pitter-patter
Pittsburg
pity
place
plain
plant
planting
plaster
plate
play
played
playing
please
pleasant
plenty
pockets
pocketbook
potato
potato-masher
poor
poorest
point, n
point, v
pointed
pointing
pointed, adj.
pony
Polly
pond
pompon
porch
post-card
Post Office
Postum
pour
pouring
powder
prayers

pretty
" Prosit "
present, n
pretend
practise
practising
preach
press
pressed
pressing
promise
promised
print, n
print, v
printed
printing
present, here
puddle
puffed-wheat
pull
pulled
pulling
pump, n
pump, v
pumped
pumping
punch
punched
punching
punish
punished
punishing
puppies
" puris "
push
pushed
pushing
pusher
pumpkin
put
puss

Q

quack
queer
quick
quiet
quilt
quite

R

rabbit
rag
rain, n
rain, v
rained
raining
rain-drop
rail
railing
railroad
raisin
Randall
rattle, n
rattle, v
rattled
raspberry
rap
rapped
raw
Raymond
razor
reach
read, present
read, past
reading
ready
reason
really
red
refrigerator
register
remind
reminded
reminding
remember
rest, n
rest, remainder
rest, v
rested
resting
rice
rich
ride, n
ribbon
ride, v
riding
rid
right, adj
right, adv
ring, n
ring, v
ringing
rinse
road
robe
Robert
Robelyn
rock, n
rock, v
rocking
rocked
rocking-chair
roll, n
roll, v
rolled
rolling
rolling-pin
roller-skates
rompers
roof
room
rooster
rope
rose
Ross
Rorer
rotten
round
row, n
rough
rub
rubbed
rubbing
rub, n
rug
rubber
rubbers
run
running
rummage-sale
Rupert
Russel
Ruth

S

sack
safetypin
said
sail-boat
salad
salt
same
sand
sandwich
sandal
sash
Saturday
say
saying
sauce
saucer
saw
scab
scale
scallop
scalding
scare
scared
scarfpin
scholar
scissors
scrape
scraped

scratch
scratching
scraps
screw, n
screw, v
seat
see
seem
seemed
see-saw, n
see-saw, v
see-sawing
send
sent
seven
sew
sewed
sewing
sewing, n
sewing-machine
sermon
seeds
served
seventeen
sense
set
shall
shoes
shirt
shave
shaving
shaved
shadow
shabby
sharp
sharpen
sharp, piano
shade
sham
shake
she
shell, n
shell, v
shelled
sheep
sheet
shoebuttoner
show
shower-bath
shovel, n
shovel, v
should
shouldn't
Shredded wheat
shut, adj
shut, v
shine
shining
shirt
shirtwaist
shawl
sick
side
sidewalk
silk
silver
silk-dress
silly
sing
singing
sin !
since
sip, n
sip, v
sipping
Sir
sister
sit
sitting
sitting-room
six
sixteen
skin
skip
skipping
skirt
sky
sleep
sleeping
sleepy
sleep, n
sleeve
sled
slide
slip
slipping
slippers
slop
sloppy
slow
slowly
smash
smear
smeared
smell, n
smell, v
smelling
smile, n
smile, v
smiling
smelly
smoke, n
smoke, v
smoking
smooth
snap
snapped
sneeze, n
sneeze, v
sneezed
sneezing
snow, n
snow, v
snowing
snug
snuggle
snuggled
snip, v
"snippy-nip"
so
soap
soapsuds
sofa
soft
soil, v
soiled
some
somebody
something
sometimes
somewhere
song
soldier
solo
soon
sore, n
sore, adj
Sorg
sound, n
sound, v
sounding
soup
sorry
sour
spank
spanking
spanked
speak
speaking
speck
spider
spill
spilled
spilling
spit, v
spin
spinned
splash
splinter
spool
spoon
spot
sprinkle
sprinkled

square
squeak
squeeze, n
squeeze, v
squeezed
squeezing
squirrel
Squires
stale
stand
standing
stand, endure
stay
stayed
staying
stairs
station
start, v
steam, n
steaming
steep
step, n
step, v
stepped
stepping
step-ladder
stew
stewed
stewing
stem
stick, n
stick, v
sticking
stick-to
stiff
sticky
sting
still, adj
stocking
stone
stomach
stop
stopped
story
stoop, v
stone-steps
store
stormy
stooped
strap
straight
straw
strawberries
stocking-cap
street
stretch
string
strong
Stroudsburg
stuff, n
stuff, v
stuffed
sugar
sun
Sunday
Sunday School
sugar-bowl
supper
suck
sunshine
summer
sunlight
suppose
surprise
surprised
sure
suit, n
swallow, n
swallow, v
swallowed
sweep
sweeper
sweeping
swim
swimming
sweater
sweet
sweetheart
swing, n
swing, v
swinging
switch
switched
Syracuse
spread
sparrow
still, adv

T

table
table-cloth
tail
talk, n
talk, v
talking
tall
take
taking
tan, color
" Tante "
tack, n
tack, v
tapioca
taste, n
taste, v
tasted
tassel
tea
teacher
teapot
tear, lacrimal
tear, v, rend
tea-kettle
tease
teeth
ten
tell
telling
telephone, n
telephone, v
Teddy bear
tender
tennis-ball
terribly
tea-party
terrible
thank
Thanksgiving
that
than
the
these
there
their
them
then
Theatorium
they
this
thing
thimble
" 'Thias "
thirds
thirsty
think
thinking
thick
those
Thompson
thought
though
three
through
throw
throwing
thread
throat
thumb
thunder
tie
tickle
tickled
tickling
ticket

tick-tock
tight
Tilly
time
tiny
tip, point
tip, v
tipped
tin
tired
to
toast
to-day
toes
toe-nails
together
toilet
to-morrow
Tompkins
tomato
tongue
tobacco
too
took
tooth
tooth-brush
top, toy
top, summit
tore
torn
touch
touched
touching
towel
tower
town
toys
track
train
tray
tree
trick
tried
trip
trill, n
trolley
trousers
trimming
trouble
try
trying
try-on
trunk
tub
tube
tuck
tucked
tucking
Tuesday
tulip
tumble
tumbled
tumbler
tunnel
tune
turkey
turn
turned
turning
turn-up
turn, n
turnip
turpentine
turtle
two
twice
twelve
twist, v
twisted
twist, n
twins
twenty
typewriter
typewrite, v
typewriting

U

umbrella
uncle
undress
under
unbuckle
understand
unbutton
unbuttoned
unbuttoning
untie
untied
up
up-side-down
upstairs
"upsy-daisy"
us
use
used
using

V

vacuum-cleaner
valentine
veil
very
visit, n
visit, v
visiting
violet
violin
vinegar
voice

W

wagon
water
wash
want
wanted
walk, n
walk, v
walked
walking
washed
washing
wall
wait
waited
waiting
warm
wakened
wake-up
waist
wabble
waste
wasted
wasting
waste-basket
Washington
wash-rag
was
watch, n
watch, v
watched
watching
watermelon
way, path
way, method
wave
waved
wax
we
wee
weak
weather
Weaton
wear
wearing
week
weeds
Weidman
weight
weighed
well, adv
well, n
welcome
went

were
wet
what
wheat
wheel
where
when
whenever
whistle, n
whistle, v
whistled
whistling
white
whip, v
whipped
whipping
whine
whined
whining
whisper
whispered
whispering
which
whiskers
whoa
who
whole-wheat
whoopingcough
while
will
wipe
wiped
wiping
wind
windy
wind, v
winding
wide
window
Will
witch-hazel
wiggle
wiggled
wiggly
wish
without
wink
winked
winking
withered
wider
wicket
wing
winter
wild
with
worm
woman
woodshed
won't
work
word
Wood
worse
world
worry
wonderful
wonder
wood
worn-out
would
woolen
write
writing
writing, n
wring
wrist
wrong
wrong-side-out
wrinkled

Y

yard
years
yellow
yes
yesterday
yet
you
your
yourself
Yochum
young

Totals

A.	76
B.	194
C.	187
D.	120
E.	42
F.	97
G.	63
H.	112
I.	24
J.	18
K.	34
L.	98
M.	99
N.	51
O.	46
P.	161
Q.	6
R.	93
S.	299
T.	160
U.	19
V.	11
W.	132
Y.	11
	2153

THE SUPREME IMPORTANCE OF READING

By John Cotton Dana, Newark, New Jersey

Men's brains have probably not improved in size and quality in the past 5,000 years. The social, economic, political, scientific and artistic life of the civilizations of Egypt, Assyria, Greece, and Rome, seem to have been as complex, broad, and full, in all essential matters, as our own. Individual men played their parts in those civilizations as readily, as easily and as completely as they do in ours to-day.

Before history disclosed this fact, the study of the method of human development had indicated that history must in due course bring it to light. It had shown that improvement of the brain, the physical basis of mind, has always been dependent on the continuance of physical and intellectual conflict, hand-to-hand and brain-to-brain conflict, between man and man; and that when that conflict ceased to be continuous, tense and to the bitter end, then the stronger brains, housed in the stronger bodies, were no longer the brains which survived, and improvement ceased.

The average man, then, has been of the same mental capacity since before the days of the pyramids. Exceptional conditions, as in the palmy days of Athens, have bred a few exceptional men. But always nature has soon again established the ancient average, her golden mean of mediocrity.

The men of Egypt, Persia, Greece and Rome, each group with the same intellectual powers, each, that is, with mechanical and chemical instruments of thought of almost identical efficiency, faced in due course their respective periods of national dominance and prosperity, and, also in due course, showed themselves to be all alike incapable of acquiring sufficient social efficiency to carry them successfully through the complex life which their brief day of dominion and wealth thrust upon them.

Shall we fail in the same way and for the same reason? or is there, in this our civilization, any factor not found in its predecessors, which may enable us to meet successfully the tremendous problems and temptations which dominance and accompanying wealth always bring to a people? And, if there is such a factor, is it the printing press?

When I name the printing press as a factor in civilization I mean, of course, the habit of reading; and when I say habit of reading, I mean the habit which is quite steadily growing in all civilized countries of using print to gain acquaintance with the great mass of human thought, experience, study and imagination.

This mass of what for the sake of brevity we group under the one word knowledge, has become very great and mounts up with marvelous rapidity. That it has become thus large and accumulates thus rapidly is chiefly due to the existence of the printing press.

Under oral tradition, when things were handed down by memory and speech only, the sum of knowledge was small. The invention of writing increased this sum very considerably. The invention of printing, however, increased it so greatly and so greatly accelerated its rate of increase that both the mass already on hand and the yearly, even hourly, additions to it can hardly be placed in the same class with the knowledge and the growth of knowledge before Gutenberg's day.

Out of this fact, out of the presence in this our own civilization of what has been aptly called an encyclopædic evolution, arises another question.

Evolution, with its survival of the more fit and the resulting improvement of the species, seems to have ceased to operate on the human race, so far at least as increase of intellectual power is concerned, before history began. We have been at our best for full 200 generations. During this long period we have failed again and again to cope successfully with the evils national success has brought in its train. We have never had to aid us in one of these crises the habit of reading; and here, perhaps, lies our salvation in the next struggle of civilization for permanence.

But, we now discover that the same invention which brought us the habit of reading has aroused to more active operation an encyclopædic evolution, an accumulation of knowledge, vast beyond all the conceptions of our predecessors. Will it, with its marvelous rapidity of growth, soon be so vast that the race which created it will be submerged by it? Is the printing press. with the monstrous body of knowledge it has permitted us to gather and now compels us daily enormously to enlarge, is this to be our Frankenstein?

It is perhaps not absurd to say, in reply, that print will overwhelm us,—unless we learn to master it. That is, our civilization faces a possible shipwreck on the sea of learning. The suggestion is not without some foundation. Whatever basis of fact it may possess supplements and augments the force of a truth too familiar to need more than merest mention,—the increasing value to men in every walk in life of the ability to take from the printed page those facts, arguments, theories and imaginings that can help him in his calling. The farmer, the bricklayer, the student of the remotest specialty in medicine and the merchant of coals or of fresh figs, all can gather from print that which will help them to find, to be and to do.

Now, it is of the essence of society's progress that its units become more efficient each in its way. No one thing can to-day contribute so much to the efficiency of each unit as can the habit of using print to learn what others have learned. Other things may contribute somewhat to this efficiency; reading can contribute most. All advocates of education have made that statement the very foundation of their faith. It means that books are the prime tools of learning; that a library is the most important of all laboratories, and that high reading power in our native tongue is the most valuable of all the acquisitions that the schools can give.

Do we need the sciences? Yes, but the mother tongue and power to read it first, for it is our language that makes us human, and to increase our skill in this is to broaden us first into citizens of our country and finally into citizens of the world.

Do we need manual, industrial, technical, vocational training? Yes; but reading first, for reading opens windows through which we can see life and learn of good and evil and become fitted for social needs.

Do we need other languages? Yes; but first our own; and the others chiefly that they may strengthen our grasp on our own. Opponents of the classics are continually forgetting that, while the arts and the sciences they advocate as the tools of training have to do with what they call tangible, practical things, the classics, rightly taught, strengthen our hold on that fundamental thing, language, by which alone thought, reason, generalization, and perhaps even consciousness itself, are made possible.

Returning to our argument. Another familiar fact that helps to make the habit of reading of supreme importance should be noted. Two things seem to be essential to the continuance of what, for lack of better words we call civilization or progress,—plasticity and peace. Of all the factors that make for plasticity with us none is as potent as the printed page. He who reads knows—and he who knows neither fears nor hates the new in manners, morals or invention; and neither hates nor fears the stranger however wonderful his features or however barbarous his customs. And communion with the printed page gives us more than anything else can give of those knowledges which bring other peoples to our very doors, teaches us to know them and then to sympathize with them, and so makes it impossible for us to hate them or fight them. Print has done many harmful things; but when we condemn the weak novel, the nickel library and the yellow journal, we may well remember that they are continually bringing letters to Caliban; that in the long run print is forever promoting that learning which is the foster-mother of peace.

We probably read more than any other nation; but we read very little. By reading is here meant not simply reading with understanding things which call for some thought; but just reading of words, however simple, and about things however trivial. The casual skimming of our lightest dailies, even this is done by a much smaller proportion of our population than is commonly supposed. The most popular of our weeklies and monthlies have each a circulation of less than a million and a half. A few thousand read books of wisdom; a few hundred thousand read books and journals of learning; a few millions out of our ninety millions read books and journals of minor information and of meagre imagination; and of the remaining many millions only a few read even the headlines of the most trifling journals.

Scarcely one in fifty of all the 50,000,000 possible readers of the country ever bought a copy of the most popular novel; not more than three or four in fifty ever looked at a copy of the most widely read of recent novels. Proceed to books of some importance, such as Eliot's "More Money for the Public Schools," and James's "Pragmatism," and you find that only a few thousand out of the fifty million ever read them and scarcely a hundred thousand ever looked at them. Yet these are books of the kind which, in the conceit of our universal culture, we suppose every person of intelligence to be familiar with. All the readers of the very few first rate literary journals we support probably number less than 100,000.

A consideration of the history of reading and of the character of the human brain shows us why the art is acquired so slowly, and in practice is so laborious that most people, even a majority of school-taught people, try to avoid it.

Reading is a new art. It was acquired by very few up to the invention of printing. A hundred years ago it was practiced by a very small proportion of civilized men. Speech, on the other hand, is a very ancient art, going back to the days when daily conflict to the death was selecting for survival the physical and mental superiors and permitting them only to propagate. Speech, not silence, was then golden. It was a weapon by which success was won. The inevitable happened. As ages went by those in whose brains speech centers were best developed lived to hand on to offspring that peculiar excellence. Skill in hearing and interpreting speech went with skill in speaking. As a result we find that to-day every normal human being is born with well-defined and cunningly related centers for speech and hearing in his brain. These centers are native to us; they are part of our humanity.

And now, after countless centuries of practice in the use of these centers and of the organs to which they relate, we invent the art of printing, and ask our brains to take in through the eye the symbols of sounds. The sounds themselves our mental machinery, after ages of practice, can handle readily with an apparatus which inheritance gives us. The visual symbols of sounds, these nature has never provided us with cerebral tools to handle.

The result is that when we read, our eyes transmit the printed words to a visual center in the brain; thence they pass to the hearing center; there they are transmuted into the sounds they stand for, and at last are understood. The word-seeing tract is not native to us as is the word-hearing tract; we must, each new generation of us, develop it anew by long practice. The path from the word-seeing to the word-hearing center is not given us by nature, and we must compel the visual symbols of sound to travel it countless times before they travel it with ease! A few, we find, have a divine gift for reading; a few others, without the gift, have the wish and the will to persist in practice until they read with ease and pleasure. The rest of mankind never acquire the art save in a crude and halting way; and of them all only a few ever have power and patience to learn to read other than simple and trivial things. This line of argument is familiar enough and is cited only to justify the conclusion that we are not a nation of readers!

Several interesting phenomena strengthen the line of reasoning just given. Children, when learning to read, pronounce the words they see that the sounds of them may reach the word-hearing center directly, through the ear, instead of by the new and difficult route in the brain, from the word-seeing center to the word-hearing center. Poor readers mumble the words they are reading, that the speaking center may help its ancient ally the hearing center to transmute the visual symbols of words into sounds of words. All readers, perhaps without exception, find if they observe themselves closely that as they read silently they pronounce in their minds the words they see. This silent pronunciation takes time, demands a certain effort, and only after long practice ceases to be a burden. The long practice is what the schools should induce and lamentably fail to induce.

One or two other familiar facts are worth citing. The political spell-binder finds to his delight that the people who read with difficulty can listen with ease and pleasure. They take in without trouble, and without permitting thought to disturb the pleasure of absorption, the flapdoodle of his oratory; they read with effort and reluctantly, if at all, the careful arguments of the student and the philosopher. Hence the royal oratorical progress across our country of our highest public servants.

Even the more intelligent often prefer the spoken to the written word. Among all the methods of acquiring knowledge of things worth while, listening to the formal lecture is probably the poorest. If one takes note of those among whom this method of learning is most popular one finds they are almost invariably non-readers.

The advocates of story-telling and instruction by lecture cite the facts just mentioned to prove the admitted fact that the ear is the natural gateway to the mind and especially to the seat of reason; and then conclude that much instruction should be given through the ears. This conclusion is confuted by the very facts they cite, for if nature developed in us a good word-hearing mechanism thousands of years ago, why waste time now in giving it needless practice? Moreover, if skill in reading daily increases in importance through the swift growth of our overwhelming mass of knowledge, and if that knowledge can be mastered a hundred fold more rapidly by reading than by hearing, it is far more imperative that the art of silent reading be taught than the art of listening.

To sum up: we have no more mental power than our predecessors had who built civilizations and then let them fall into ruins. Print may be the new factor which will save our civilization. Print is so rapidly promoting encyclopædic evolution that our learning may overpass our powers of generalization and application. To prevent this we must become a race of skillful print-users. It is of supreme importance, therefore, that we learn to read. At present we read little because the art is one for which our brains do not inherit the apparatus.

THE DECLINE OF THE CLASSICS AND THEIR PLACE IN FUTURE CURRICULA

By John A. Magni

Every careful observer must admit a marked decrease of interest in the classics both in Europe and in the United States. Whoever visits the Greek and Latin classes in secondary and higher institutions of learning is struck by their smallness and is forced to confess that these subjects have lost much of their former prestige. Movements in some parts of our country, for instance California, with a view to the reconstruction of all schools under state control, entirely eliminating the classics, is a significant sign of the times. Many hail it with unmixed joy as a proof that our age is truly progressive. But what it really proves is, that human advancement is not in a steady, straight line, but zigzags, and now and then retrogresses at certain points. Human vision from various causes grows dim at times, fails to recognize and appreciate real advantages and culture values already attained.

Now then, what is the chief cause of this changed attitude towards disciplines once looked upon as the very *sine qua non* of a sound, thorough and well-rounded education? The answer is quite simple. Man is at heart a utilitarian. Our age more than any previous one has called forth and emphasized this characteristic. Hence it follows that education must now serve some direct and immediately useful end. Whether with Prof. O'Shea we define education as adjustment to one's social environment, with Prof. Bagley and ex-Pres. Eliot as social efficiency, or with the American farmer and business man as a means for getting bread and butter, or making money and becoming rich quickly, the conception of education as essentially a material and temporal matter, is perfectly clear. The agricultural colleges, the industrial and trade schools, business colleges and schools of domestic arts, etc., that are springing up everywhere tell the same story. Some of us may try to persuade ourselves by all sorts of arguments that the old cultural ideals in education are still vital and in full force among educators and the masses of the people. Let us not deceive ourselves. If we look existing facts fairly and squarely in the face, estimate and appraise actual concrete social conditions as well as emotional and mental attitudes in this matter, we shall be forced to admit, though with regret, that the eternal is at a heavy discount in our day. Modern man may be said to re-enact Brahma's night experience. This great world-spirit, according to the ancient Hindoo philosopher, having once withdrawn into a mathematical point, i.e., a pure timeless, spaceless spirit, which to him was equivalent to day, light, and self-sufficiency, "desired to go abroad," and therefore expanded into the infinite atomism of time and space and thus went through a long period, *kalpa,* of unconsciousness, night and chaos. To-day man directs all his attention to the spatial and temporal, devotes all his energy to the conquest of matter, forgets, and even seriously doubts any other form of existence. The result is night, chaos and confusion in his mind, both regarding ideals of education and of life. Truth has vanished, only opinion remains. "The chain of workings set up by an opinion is that opinion's truth, falsehood or irrelevancy as the case may be," is the late Prof. Wm. James' definition of truth. Unquestionably modern man, owing to the ineluctable Zeitgeist, has become too infatuated with the sense side of life, because it is so tangible, and appears supremely real.

It is reasonable to assume that future writers of the history of education will refer to this onesidedness as an aberration of the human mind, a lack of perspective and balance. For just as Brahma returns from his state of self-externalization into the pure incandescent light of his own perfected spiritual selfhood, so for man a day will dawn with clearer light and larger spiritual perspective, he will come to himself. Education has two sides, or a double meaning. Says C. H. Henderson: "It is the outward visible result of an inner experience or it is the movement of the inner experience itself. . . . The outer aspect of education is knowledge, the inner aspect is development." The present exclusive emphasis of the outer or material aspect of education, however, is natural and inevitable. A trained scientist knows full well that science has nothing to say on human destiny, or first principles, she deals solely with appearances. It is metaphysics that attempts to discover the cause or underlying reality of cosmic becoming, but natural science declares all such attempts utterly futile, and is resigned either to a blank nescience or annihilation. Recall, for example, the views of Spencer and Clifford, the latter of whom had this tragic record inscribed on his tomb: "I was, I loved, I am not." Man is rooted in and entirely limited by his capacities, they tell us, to time, space and sense. They also insist that all beings exist under these forms, i.e., the real universe is purely objective. But they seem to forget that such a universe is the result of pure speculation, without a vestige of experience. A universe entirely apart from human consciousness, or a percipient ego, is a thing, or rather, insane brain-spook, of which absolutely nothing can be predicated. The idealist, on the other hand, whose world-conception rests on pure experience, although he frankly admits that his consciousness is chiefly made up of feelings and emotions, nevertheless recognizes a small fraction of his psychic content as of an essentially different nature, viz., reason or intellect. Now, this divine capacity makes him an apologist of a suprasensible world and an endless life. The very mystery of consciousness and personality, its ceaseless irrepressible quest of ultimate reality, of meaning in the flux and flow of things and the never-flagging pursuit of the highest perfection in goodness, truth and beauty, are to him irrefutable proofs of his own immortality. And so he devoutly believes in higher attainments and a grander destiny for man than that of earth, and revolts against every attempt to reduce man's personality to dust and " fortuitous atoms." But the ear of our age is deaf to the protest, growing daily fainter, and the divine discontent does not move its heart, indifferent to all otherworldliness. Wherever there is a genuine striving, a real desire for powers and possessions not of the earth earthy, it is merely a dark feeble groping, lacking conscious and scientific guidance.

Now, since the universal tendency of man's nature to-day is not inward as for instance during the middle ages, but outward, whose aim can only be conceived in terms of space and time and social effects, we are not at all surprised at the present aim in education. " Education is wrapped up in the philosophic idea quite as completely as propositions of geometry are wrapped up in the initial axioms," says C. H. Henderson. The prevalent world-conception to-day is in its essence a materialistic monism with a slight varnish of idealism. Natural science dealing entirely with objective reality has wrought this radical change. Psychology has reduced the soul or human personality to a " shadow-man superimposed on the psycho-physical organism." Pragmatism, an outgrowth of modern psychological prying, and the all-dominating spirit of commercial usefulness, finds no cosmic unity, no permanency in the eternal flux of things, no static truth, and ends logically in unconditioned and absolute scepticism. This philosophic idea is to-day more popular and more widely diffused than many suppose, in fact, it is an unreasoned, unconscious world- or life-concept with many, even educated people, who never studied pragmatism technically so-called. Is it any wonder, then, that man is really and practically nothing but a money and wealth-producing machine? In a time of breakneck speed to accumulate wealth and the ferocious greed for money that sets aside conscience, outrages humanity, and reduces man to a mere tool for profit-making, can we expect studies to flourish that by their very nature only enlarge, heighten and sharpen man's capacities for enjoying the true, the beautiful, and the good in nature and art? Fads and dilettanteism in these things are quite sufficient for all commercial purposes—deep, broad, genuine culture, requiring much time and money is, as a rule, neither eagerly sought nor highly appreciated in our age of bread-and-butter philosophy. Look at the toiling millions of our land who by hard labor eke out a meager living, but are entirely ignorant of the higher things of the spirit, the boundless treasures of ancient and modern literature and art; then scrutinize their employers, the plutocrats and multimillionaires, often snobs or dilettanti, innocent of that deep genuine culture which lifted ancient Athens into that unrivalled, exalted position from which she has never been dislodged. Are our material prosperity and achievements anything to be permanently proud of in such a state of things? No, we need a deeper, saner philosophic idea as the educational *nisus formativus* of human society, or future man will point a finger of scorn at our imagined greatness and boasted superiority. This idea is contained in that profound and eternally true evaluation of human personality made 1900 years ago by the great and peerless teacher and appraiser of moral values, the prophet of Nazareth. Until human personality is in fact and in deed regarded as of such transcendent worth that all the riches of the earth, yes the whole world, pale and dwindle into insignificance in comparison, all educators will be bunglers, and their work vain. The notion that man is a tool, a means for sordid, perishable gain and profit must be abandoned, and his true dignity restored by recognizing him as an end in himself as taught by Jesus and Kant. The sooner our educators fully realize this, the better for our schools and our country.

Since education has become simply a means for the production of material wealth and bodily comfort none need be surprised at the rapid disintegration of the cultural ideals cherished by our fathers and entrusted by them to an educational system for further propagation. However absurd many in this age of material progress may think it, there are numerous evidences for the truth of the assertion that there is a decided retrogression and deterioration in education, a trend towards superficiality and incompleteness, a marked waning and decay of sound, genuine, thorough soul-culture. Let us mention but a few of these evidences. The passing of the classics is striking evidence and very significant, another is the influence of wealth at our colleges and universities. Here the classic genuineness, and democratic simplicity of olden times are rapidly vanishing; the sideshows already overshadow the main work, as Woodrow Wilson pointed out while at Princeton. Our higher institutions of learning are being transformed into social clearing houses for social preferment and success, rather than cherished as seats sacred to intellectual achievements, culture and the building of character. Says Owen Johnson in *Collier's Magazine:* "A force within it (the college) has grown, solidified itself, assumed control and imposed its standards of success, which are in direct opposition to the standards of intellectual pre-eminence." A third is the employment of so many women as teachers (more than ¾ of our teachers are women), and often for purely business reasons, simply because they cost less. This is a grave error. It is really too bad that our educators and school boards fail to see that a human being during the plastic and formative period should also be partly at least under the virile influence of man. A fourth is the preference for young immature men and women too often with but a very meager education, instead of mature and middle aged persons with ripe judgment, deep and broad erudition, and superior training. Such errors and lack of sound pedagogical judgment constitute a deplorable turn in our western education. These and many more facts could be adduced to show the same basic trend in American life, and as long as it dominates, purely cultural subjects, like the classics, deep and serious study of literature will receive but slight emphasis in our curricula.

In the midst of all these hurried attempts at educational reconstruction would it not be wise to stop and seriously consider whether this intense desire to break entirely with the classic past is not, to a certain extent at least, retrogression instead of advance? A careful sympathetic study of the causes and the esthetic motives that led the men of the Renaissance to give the classics the prominent place in their educational program might enable us to perceive in them a permanently intrinsic educational value. Our medieval colleagues exaggerated this to be sure but their enthusiasm was far from baseless. It is true, they saw in the recently discovered ancient literature a scientific value that we of course must reject, but their interpretation of its esthetic and cultural aspect is in the main sound. The freshness of feeling, the intimacy and oneness with an unspoiled, unanalyzed and mysterious nature, the spontaneity and naïveté, as well as depth, clearness and originality of thought, the unsurpassed richness, beauty and plasticity of form revealed by the classics, charmed and inspired with boundless hopes such men as Dante, Petrarch, "the first modern man," Erasmus, the greatest classicist of his age, Reuchlin, Melanchthon, the *praeceptor Germaniae,* Johannes Sturm, Goethe, et al. This attitude was perfectly natural in an age whose ideal was vast erudition and deep culture for its own sake, irrespective of practical results. This unreserved abandon to and absolute identification with the *inner* essence and aspect of education seem to the modern educator positively vicious, a fatal negation of practical efficiency, yes, modern man is totally averse to this conception of education. Must we then conclude that with us wisdom began, and that these ancient *savants* lacked all insight on this point, and merely indulged in inane vagaries? Yes, perhaps if life is not more than meat and body more than raiment, if the Lucretian solution of existence, viz., "the fortuitous concourse of atoms," or, "when death is, we are not," is to be the universal verdict of future humanity—but this final and definite verdict has not yet been rendered! Still if the possible transcendental value of education should, for a time, lose its grip on the human soul, education will not degenerate into a bald bread-and-butter philosophy, but it can be confidently predicted that the emphasis on its purely inner or cultural aspect, now reduced to an almost negligible minimum, will be greatly increased in a not very distant future. A deep conviction will again prevail that education is not merely a means for securing temporal and objective ends, but just as much a method of self-realization, self-unfoldment, a higher, richer and deeper consciousness. It is also certain that idealism, already maintaining itself for more than 2,000 years, and being greatly enriched and reinforced by modern philosophic and, especially epistemological researches, will deepen this conviction as the ages pass. It will also be apperceived more and more clearly that the time can never arrive when personality shall have yielded up its last vestige of mystery and thus stand forth as a naked analyzed object, i.e., its transcendental nature can never be definitely disproved. Therefore there will always be ground for the belief or hypothesis that education, training and experience in time, may be of timeless, inestimable value.

By recalling to mind the reasons why the classics were esteemed so highly by the medieval and early educators and the social conditions that gave Latin, for instance, such a firm footing, we shall be better able to understand why they are now looked upon as superannuated and useless. First, they were supposed to be the best guide in the interpretation of nature. This was especially true of Greek. Modern science was not yet born, and Aristotle, the great polymath and master in natural science, had not yet been relegated to the lumber-garret by Francis Bacon and Galileo. Second, they were looked upon as unsurpassed means for mental training and higher culture. Third, Greek soon acquired great importance for theological and ecclesiastical purposes, since the New Testament and many of the patriotic fathers were written in this language. Fourth, Latin was the language of diplomacy, the vehicle of thought, written and spoken, of the higher classes and educated people, as well as the sacred organ of the dominant Catholic Church. Under such conditions it was perfectly natural for a Johannes Sturm to inaugurate an almost exclusively Latin curriculum in his famous Gymnasium, founded at Strassburg in 1537, after which the humanistic Gymnasium in modern Germany is patterned.

At present none of these social conditions exist. Hence when by the end of the seventeenth century they ceased, one reason for their retention in the curriculum, although tacitly accepted all through the period of their most assiduous cultivation and fairest bloom, was then especially emphasized. This was the famous doctrine of their disciplinary value. This fact, then, strengthened the habitual attitude of respect and love for classic learning during a period of more than three hundred years, and gave them a new lease of life lasting down to our own day. This reinforced habitual attitude towards the classics is unquestionably the chief reason why they have played such a prominent part in school curricula during the last two hundred years. In our day various economic forces have counteracted, modified and broken this neural momentum. For it can no longer be doubted that an habitual emotional attitude toward an object, as long as it is undisturbed, gives this object its human or economic value. This explains also the *raîson d'être* of those "deep-seated errors on which almost all abuses are founded, the servile worship of eminent men and the irrational dread of innovation." This certainly is true of the majority of human beings. For those individuals are exceedingly rare of whom it can be said as of the dispassionate and clear-headed Spinoza that their virtues are of the type called "dianoetic" by Aristotle, those where thought takes the lead and the will follows. A purified intellect, however, seeing the truth in its own incandescent light uncolored by feelings and passions, must be universally recognized as the protagonist in human affairs before the societies and nations of the earth can emerge from their present chaotic and barbarous state. Modern psychology has clearly revealed the extraordinary significance of man's emotional life, the tremendous power of neural habit. It is in modern thought the inexorable *fatum* of the ancients, the *vis minima* of natural science.

The grip of the classics on education for the last two or three hundred years is not due to a clear apprehension of their intrinsic superiority over other disciplines. Man has never directed his actions upon pure reason and clearly apprehended truth. The emotions, the passions, continually eclipse the idea that repeatedly may occupy the focus of consciousness. Taking truth in this narrower concrete and psychological sense of an individual, consciously focalized concept, we can easily see why it has not been embodied in social institutions. We can also understand why modern psychology declares conscious choice of evil an impossibility, thus coinciding with the Socratic dictum that knowledge and virtue are identical. Most men choose what, at the moment of choice, seems best, because their consciousness is colored by individual selfish feelings which are not attuned to the objective ethico-esthetic world-process making for universal human excellence and human wealth. Were this not so, the world to-day would be very different from what it actually is—a paradise wherein would now dwell righteousness, justice, peace and happiness. But the cold fact is, that neural habit, or emotion, constitutes the most elemental and determinative force in the entire animate creation, the psychic *nisus formativus* which has held and still holds man in its fate-like grip. Conscious-logical thought, which transcends blindly groping and slowly plodding nature, because it is a thing absolutely *sui generis* in being self-transcendent and therefore anticipates the unconscious processes of nature by thousands of years, stands almost helpless in the presence of this formidable agency in its cosmic sweep. This accounts for the exasperatingly slow ethical progress of human society. The beast of the primordial jungle holds it back. Truths and ideals sufficient to transform earth into heaven were clearly apperceived and made known more than two thousand years ago by some rare deep and far-seeing souls. But man is so completely engrossed in the temporal salvation of his own little tin-pot soul, and his intellect so darkened by sense that he utterly fails even to glimpse that human life of perfection and ideality which lies within his grasp and power of realization. Self-centeredness instead of a world-wide self, identifying itself with all, greed for things of sense, lust for power, exploit, dwarf and enslave all humanity. Whoever with an open and unbiased mind observes and studies men and women in all walks of life to-day must frankly confess that the almighty dollar is the supreme object of their love and devotion. Economic conditions and the all-dominant capitalistic spirit of our age have clipped the wings of idealism and placed a heavy, sordid and earthy hand on the human spirit.

Education, which above everything else should be a ministering angel of man's ideal and spiritual wants, is too much under this same earth-bound spell. Says C. H. Henderson: "We make a fetish of the public school with its cheap information and shopkeeping accomplishments, but we have not yet conceived of human life as a moral and esthetic revelation of the universe, and of education as the practical process of entering into this tremendous possession." Instead of giving the child a truly cultural, i.e., organic training, permitting it to live a full, free, natural life, in growing to assimilate the best in human culture, we subject it to a veritable hot-house education. Childhood and youth, which are as much ends in themselves as mature life and old age, should be normally and completely enjoyed if we would attain the true social purpose, a symmetrical, harmonious and complete human personality. This end can only be reached through spontaneous activity fraught with joy and interest. How far we are from this ideal every unprejudiced observer knows very well. The reason is plain, it is the mercenary spirit, the business aims controlling and reducing everything to business standards, business evaluation, in brief, to a money-making machinery. Even the much lauded craze and demand for specialism is a movement away from genuine culture; for it fosters a narrow and comparatively barren life. The average, and frequently the best, specialist is better suited to do research work than to serve as an inspiring guide for young ardent souls in the lovely fields of beauty and goodness, or on the delectable mountains of truth and large spiritual vision. We need what Pres. Butler said a few years ago, "broad men sharpened to a point," yes, more, we need teachers, "with warm human hearts beating with high moral, social and artistic purpose, not operatives in the factory of instruction."

Another reason for the passing of the classics is found in the recent results of experimental pedagogy. Already Aristotle had divided the human mind into so-called faculties. This was the beginning of psychological atomism. The human soul was conceived as consisting of a hierarchy of powers or capacities working independently of each other. Thus judgment, reason, memory, attention, cognition, perception, apperception, etc., arose. This splitting-up of the mind's original unity was the conception that prevailed during the middle ages and down to our own day. It was in this time-honored doctrine that the lovers and ardent admirers of the classics found a strong support. The different faculties, they reasoned, can and ought to be properly trained. In this way the doctrine of formal discipline came to the fore, though tacitly accepted all through the Renaissance and Humanistic movements. The classics were believed to furnish a general training superior to that of any other subjects, and for this reason they were assiduously cultivated. " You can do better work as a farmer if you learn Greek and Latin," the writer was told by college chapel orators while as a student he struggled to master the speech of the great Greeks and Romans. Many things have been said so often that by mere dint of repetition we have come to believe in them as truths, and it never occurred to us that they might be either false or only partly true. It is only a rigid experimental test that can give us the truth in many fields.

Formal discipline may be defined as denoting a training which results in a general increase of mental power independent of the subject matter and thus enabling the student to master the new and unexpected. In other words, it claims to cultivate a general power of conscious, self-directed learning, thinking and reasoning. Now, quite a number of experimentalists have attacked this problem very seriously during the last few decades. Among these may be mentioned Volkmann, Profs. Wm. James, Thorndike, Woodworth, Bagley, Taylor, Coover and Angell, et al. An account of these experiments is not necessary in this article since access to the originals is easy, or to the good resumé of them in Professor E. N. Henderson's text-book on " The Principles of Education," or the one in Heck's " Mental Discipline and Educational Values." We find that all these experiments when rightly interpreted fail to prove the spread of the effects of special training, and the conclusion at which these experimenters arrive is that there is no development of a general mental ability by any specific training apart from the establishment of definite associations. Prof. Henderson is convinced that, "subjects should not be chosen for their formal discipline alone. Training in method is most economical and most effective when it is given in connection with content the mastery of which is in itself valuable."

Unless future experimental data greatly modify present results, it is clear that the old classic conception of formal discipline was fundamentally wrong, viz. that certain subjects apart from a specific content will increase the student's mental power and efficiency. We are also forced to conclude that no particular subjects are superior as means of this specific mental training. To be sure, observation shows that educated people as a rule can better meet and adapt themselves to a new situation than the uneducated. But it is perfectly reasonable to suppose that the former excel both as students and later in practical life by sheer innate or inherited ability, rather than because of the pursuance of certain studies.

The term mental or formal discipline, however, is still retained by psychologists, but modified to mean "training in those methods of treatment that are adapted to what might be called the form of a situation." Formal discipline, then, is specific and involves definite stimuli and definite responses, or in other words, the function of formal discipline is merely the cultivation of certain attitudes, the necessary concomitants of definite mental and motor adjustments.

If these conclusions are correct, can we as lovers of the classics maintain our position? Can we save what we consider a precious heritage left us by the ancient Greeks and Romans to our children and to coming ages? If, as a specific disciplinary agency the classics are merely on a par with the modern and more *useful* subjects in the curriculum, can it be proved that the classics are really indispensable? Or must we join the extreme educators in their vehement hue and cry against these useless, antiquated studies that still encumber the curriculum and retard human progress? If it can be shown that beside the specific disciplinary value which they possess in common with the modern sciences, languages and literatures, they also have an intrinsic worth peculiarly their own, i.e., that they give us something not to be procured elsewhere, then the classics are justified.

An unbiased mind should be convinced after due reflection, that the present opposition to the classics is not well founded and, hence can only be temporary. It is evidently due to two things, (1) the extreme materialistic and utilitarian spirit of the present age, (2) to ignorance of classic literature, art philosophy and philology, a lack of deep, prolonged and thorough study of these subjects. And this deplorable ignorance on the part of educators must be attributed either to lack of time, incentive, ability for such study, or to an innate emotional bias and distaste, and, *de gustibus non disputandum est.* But for these very reasons the opposition can, in the nature of things, only be a passing one. Such individual factors do not ultimately determine the general trend of human growth and progress. If you are an idealist, you will apperceive a deeper, inner, shall we say, ethico-rational, *nisus* determining, in the last analysis, human and social evolution. This may smack of mysticism. But as Prof. Robinson of Columbia University says, " Even those of us who have little taste for mysticism have to recognize a mysterious unconscious impulse which appears to be a concomitant of natural order." Bergson calls it *l'elan vital,* and Prof. Creighton, the universal functioning in the particular.

Classic antiquity created both a form and content value that modern society cannot ignore without impoverishing itself. It is indeed doubtful whether any sane and thoughtful educator, who has taken pains to look into the matter, can deny that, as a means of training the power of attention, accuracy and the memory for details, the classics have no superiors. Now, such a mental efficiency, even if it cannot be directly transferred to an incongruous field of mental activity, as Prof. Hinsdale pointed out in a paper before the N. E. A. at Asbury Park in 1894, and as has been corroborated by later experiments already mentioned, still is valuable as an ideal as Prof. Bagley has well said. Furthermore, will not the richness, the marvelous differentiation of thought as it is mirrored in the Greek language strike the student as a revelation? Nor can too great emphasis be laid on the clearer understanding, the firmer grasp and deeper appreciation of the English vernacular resulting from a study of the classics. Furthermore, what shall we say about the new and deeper insight into the world of beauty and art? A few striking examples will suffice. Dante, who created a work which, despite its medieval spirit, content and cosmogony, has survived the ravages and vicissitudes of time for six centuries, frankly acknowledges Vergil as his master and guide. It would be difficult to imagine the nature of the " Divina Commedia " without its classic inspiration. And what about Milton's sublime sacred epic if the Hellenic spirit were not intimately fused with the Hebraic? It is this that makes John Milton a poet for the world and for all times. Again, Goethe, the greatest genius and intellect Germany and modern times has produced, looked upon his sojourn in Italy, 1786-88, amidst the glorious remnants of classic art, as a real new birth into the kingdom of beauty. So profound and genuine was this experience in direct contact with the noble efflorescence of the Greek genius that it transformed his literary art. Have our rabid classic iconoclasts of to-day ever sufficiently pondered this significant event in the history of literature? But aside from these formal excellencies the genuine teacher of the classics is fully convinced that as a cultural content study they are second to none. Once thoroughly imbued with the best in Greek and Roman thought he will heartily scorn the purely utilitarian view of life which, as we all know, is now blindly worshipped by the majority of men.

Still despite this retrogressive move in our civilization, the loyal disciple of the immortal masters of thought and art among the ancient Greeks and Romans preserves his equanimity and remains true to the never-surpassed, the never-aging Greek maxim, μηδὲν ἄγαν. He knows full well that when our western culture is older, our thought-life maturer, our consciousness deeper and intellectual vision clearer, then our youthful fancies and vagaries will appear in their true light—the pendulum will return. Our opponents admit even now, that if we would fully understand and appreciate modern civilization, society, laws, arts and institutions, we must go back to ancient Greece and Rome. Reflect on this fact for a moment, you who are a utilitarian dyed-in-the-wool, you who claim to have no time to acquire this deeper classic knowledge and insight and insist, in season and out of season, on social, practical efficiency, remember also that, everything else being equal, the man with a perfect comprehensive grasp of the constitutive elements and principles of art, philosophy, pedagogy, religion, ethics, politics of our modern life as rooted in the past, is unquestionably a safer guide and leader than the dilettant conversant only with the modern fraction of human experience. To be sure, a standing excuse for not studying Greek and Latin is that these remarkable civilizations can be studied without wasting so much time in learning these dead and difficult languages. This trite objection is only a half-truth. For in the first place, if we would get at primitive, outgrown ideas in order to discover how many are still alive or lead a galvanized existence in our modern society, we must study the ancient languages themselves, because in the original word or its root the primitive idea will often lie hidden. It is the analytical linguist fortified by psychological training and insight who recognizes these Ibsenian ghosts from a hoary past, while the ordinary man takes them for red-blooded living realities. What a mental house-cleaning such a study would bring about in social ethics, politics, religion, etc.!

But besides this truly social purpose of classic studies and that which has hitherto been the chief aim, viz., the cultivation of the finest esthetic taste, the classics should also be studied with the specific end in view of throwing light on the childhood of our race by digging down into its phyletic roots. For by a deeper insight into the childhood of the race we can better understand and so deal more wisely with the budding infantile soul to-day. The classics have not yet been studied in the light of genetic psychology and primitive culture with the degree of seriousness the subject really demands. Let training in this new science be combined with that in philology, and valuable results are sure to follow. But in the second place we should bear in mind that no translation, even the very best, can take the place of the original. This is absolutely true of the great masterpieces of the world. Says F. W. H. Myers: "No words that man can any more set side by side can ever affect the mind again like some of the great passages of Homer. For in them it seems as if all that makes life precious were in the act of being created at once and together—language itself and the first emotions, and the unconscionable charm of song . . . what words can express the sense which we receive of an effortless and absolute sublimity, the feeling of morning freshness and elemental power, the delight which is to all other intellectual delights what youth is to all other joys? And what a language! . . . There never has been, there never will be a language like the dead Greek. For Greek had all the merits of other tongues without their accompanying defects. It had the monumental weight and brevity of the Latin without its rigid unmanageability; the copiousness and flexibility of the German without its heavy commonness and guttural superfluity, the pellucidity of the French without its jejuneness, the force and reality of the English without its structureless comminution." And Lord Macaulay has this to say of the Iliad and the Odyssey: "Those two strange old poems, the wonder of ninety generations, still retain all their freshness. They still command the veneration of minds enriched by the literature of many nations and ages. They are still, even in wretched translations, the delight of schoolboys. Having survived ten thousand capricious fashions, having seen successive codes of criticism become obsolete, they still remain to us, immortal with the immortality of truth, the same when perused in the study of an English scholar, as when they were first chanted at the banquets of the Ionian princes."

Some one may retort that these are the words of enthusiasts, extravagant adulations of antiquity because it has been in fashion so long, as for instance Madison Cawein, the American nature poet thinks. And yet, is it not remarkable that, ever since the rediscovery of the classics in the thirteenth and fourteenth centuries, men of the finest intellect, the most highly developed esthetic taste and thoroughly grounded in classic lore, have been similarly affected, from Dante down to our own day. Of the moderns, Goethe is a case in point. But listen to Tennyson, the greatest English poet of the nineteenth century, in his exquisite tribute to the Mantuan bard on the nineteen hundredth anniversary of his death, a tribute so full of sweet music, genuine feeling, and fine appreciation:

> "Roman Vergil thou that singest Illion's lofty temples robed in fire,
> Ilion falling, Rome arising, wars and filial faith and Dido's pyre;
> Landscape lover, lord of language, more than he that sang the Works and Days,
> All the chosen coin of fancy flashing out from many a golden phrase,"
> etc.

And although he drew only indirectly an immense amount of material and inspiration from classic sources, what would our own peerless Shakespeare be without them? Libraries have been written on the ancient literary masters, and those who have drunk deeply from the Pierian spring need not be told why, Lord Macaulay, whose splendid command of English and forceful, lucid style are admired by all his readers, used to read Greek and Roman authors on his journeys to India and other places for the exquisite enjoyment and intellectual benefit derived from them. Milton's compositions, he thinks, should be studied by every man "who desires to become acquainted with the full power of the English language." As for Milton's lyric poetry, every reader knows that it exercises an irresistible fascination by its intense feeling, exquisite beauty and sublimity. The reason is clear, his essentially lyric muse received her nourishment and inspiration from the native fountain-head of lyric song, the Greek. "He was a profound and elegant classical scholar."

Now suppose our education were such that the best classics supplanted the carloads of cheap, worthless trash, offered the traveling American public as mental pabulum at all railroad newsstands. Does any one doubt that such a revolution in the moral and esthetic taste of our people would be a desirable thing? A demand for the best in the English vernacular would follow "as the night the day." Why is it that taste for classic and high class literature, especially dramatic and lyric, is keener, correcter, and more widely diffused among the different classes in Germany and France than in the United States? Because for centuries past the classics have set the esthetic standard in those countries. The work, in Germany, of such men as Martin Opitz, Winckelmann, Lessing, Goethe and Schiller and classic scholars too numerous to mention, and in France, Boileau, Molière, Corneille, Racine, Voltaire and a host of others, has left a profound and indelible impression. For the esthetic education of the German and French peoples these men performed a service of inestimable value despite all the dead, stiff formalism and unnatural correctness that must be laid at their door. French literary art began with the organization of the literary language by Boileau and the Academy. Victor Hugo, the climax in French literary art, walks in the ways of his predecessors. In Hernani, Corneille is visible. Boileau, Corneille, and Racine, drew their inspiration chiefly from Horace, Vergil, Seneca, but Fénélon appreciated and appropriated the best Greek writings. Before beginning his Télémaque he translated six books of the Odyssey in order to saturate himself with the style. To illustrate this point let us take the two great masterpieces, Faust and Hamlet. The two possess a fundamental kinship, both are tragedies of thought, and there is as much deep reflection as interest-sustaining action in either. In Germany every billiard marker puzzles himself over Faust. " Students earnestly wrestling with doubt," says Lewes, " striving to solve the solemn riddles of life, feel their pulses strangely agitated by this poem." Such a deep, widespread and lively interest in Shakespeare's masterpiece does not exist among Americans. Does not this fact show that our literary and esthetic education is not serious and thorough enough? Higher esthetic standards must continually be set before our young people, and more persistent, enthusiastic efforts made to interpret to them the noblest works of classic art whether literary or plastic.

As for France it is a well known fact that as a vehicle of literary art the French language is unsurpassed in modern times. An unbiased student will also recognize that much of its superiority is due to the severe and serious work of the French classicist during the golden age of French literature. It is also a fact that these superior qualities, beauty, elegance, lucidity, etc., of the French language have affected the speech of the lower classes and become an unconscious possession. Years ago the writer learned that many a French fishwife, for instance, when called into court, had astonished the judge and lawyers by the elegant and forceful language in which she was able to couch her thoughts. The Frenchman's love of dramatic art of a high order is so well known that it scarcely needs mention.

In order to show more clearly that a translation will not serve as a substitute for an intimate knowledge of the classics themselves, an illustration from nearer home will suffice. No one who has so mastered German, for instance, that he can feel and think with Goethe in reading, or better, living and acting on the stage his immortal Faust drama, will for a moment, admit that any or even the best translation will do just as well. A piece of real art can be most effective; reveal itself in its unique, inimitable beauty, charm, and emotionally overmastering power only through that immediacy which is the artist's own possession. The vernacular is the most subtle, the most spiritual and perfect medium of the soul's self-expression. "The deeper and more complex parts of human nature can be exhibited by means of words alone," says Macaulay. A genius of the first order is an incarnated epitome of his race, and his deepest experiences are at once the most intimate, original, permanent and universal. But their content when separated from their original form, loses more or less of its beauty, plasticity and captivating virtue. in a word, its unique spiritual aroma. A flower transplanted from one soil or climate to another does not remain the same. A Dante scholar has said that it is worth while to master Italian for the sole purpose of reading the Divine Comedy in the original.

Since the above was penned the writer has come upon some passages in G. H. Lewes' book, "The Life and Works of Goethe," which are in such perfect accord with his own view that he cannot refrain from quoting the words of this eminent and careful scholar. Speaking with reference to Faust's sad soliloquy of despair which follows Wagner's exit, he says: "The thoughts and the music in which they are uttered, must be sought in the original, no translation can be adequate." This is also applicable to a large portion of this unique production, which is at once a problem and a picture of human life. When Mr. Lewes first read Faust (in a translation) he says he was disappointed and thought that Goethe "had missed his aim." But he adds: "As I grew older, and began to read Faust in the original (helped by the dictionary), its glory gradually dawned upon my mind. It is now one of those works which exercise a fascination to be compared only to the minute and inexhaustible love we feel for those long dear to us, every expression having a peculiar and, by association quite mystic influence." Again, referring to Charles Lamb's singularly unfavorable opinion of Faust he declares it "an opinion he never could have formed had he read Faust in the original. He read it in a translation, and no work suffers more from translation." The same is true of Coleridge. Again and again Mr. Lewes protests against "the adequacy of all translation of poetry," and declares it at best only an approximation and never "an adequate reproduction of the original." The cause of this, he shows, "lies deep in the nature of poetry." He lays great stress on the music of poetry and quotes Beethoven's statement that: "Melody gives a sensuous existence to poetry; for does not the meaning of a poem become embodied in melody?" Then he also points out that in a general way a translator can reproduce the meanings of a poem and of its individual words but not the music, the form, "nor those precise shades of suggestiveness on which the delicacy and beauty of the original depend." The reason he assigns is simple, "in a poem meaning and form are as indissoluble as soul and body." The application of all this to the peerless Greek, as previously discussed, is self-evident.

Closely related to the above argument is another that has not received the emphasis and attention it deserves. We all know the value of coming into direct touch and intimate relation with a great and noble soul, because our own individual lives are thereby enlarged and ennobled, in brief, we gradually make his qualities our own. Now the acquisition of a foreign language is equivalent to direct communion with a larger personality than that of any human individual, for it embodies and reflects the soul, the emotional and intellectual life, of a certain nation. It is therefore a wise saying of Cicero, often quoted but little heeded, viz., that he who learns a new language acquires a new soul.

Furthermore, as previously intimated, the classics could be made a valuable source by the student of genetic psychology and primitive culture. Here is still a vast amount of unutilized animistic lore, to be obtained by a study of the sentence, the word and its root in the original, which might be used to elucidate human childhood. Pres. G. Stanley Hall, whose keen and versatile mind has for years been engrossed in the study of psychogenesis, recognizes an urgent need of research along this line. If education is to progress instead of becoming stagnant and sterile, a mere recapitulation of the past, as in China for 2,000 years, and finally failing in its great maieutic task of bringing to birth new ideas which promote social rejuvenescence and perfection, the educator must dig deep down into the soul of our common humanity. Pope's well-known saying, "The proper study of mankind is man," is a never-aging truth, but the reverse is equally true; the two are reciprocal. The individual intellect by tracing its history in that of the race will gradually become the purified and spotless mirror of nature. It is a very old subject but forever new, fresh and rich. In its inexhaustibility lies its never-palling charm and fascination as well as in man's endless perfectibility. Self-knowledge must precede real progress, because it secures all knowledge. History continuously proves its individual and racial essentiality. Had the scientific as well as prescientific and religious doctrine of monogenesis been known and practiced in ancient India, the crime against so many millions of men, viz., the caste system with all its dire and degrading consequences, would never have existed. The ridiculous spectacle of the strutting, arrogant and self-important Brahman imagining himself sprung from the head of Brahma, and the Sudra supposed to be the lowly offspring of his feet and therefore wedded to a life of earth and dirt, would never have disgraced the annals of man. Had educators known and heeded the doctrine that the child, during its prenatal and postnatal development, mirrors the age-long evolution of the race, it would never have been treated like an adult, but its instruction suited to the successive stages of growth, and the schoolhouse would never have been degraded so often during all these long, weary centuries to a place of loathing, terror and torments.

We have certainly advanced during the last hundred years, but we are still primitive and crude in our knowledge and treatment of the child. An imperative desideratum in our education is that the teacher possess both a Pestalozzian sympathy with, intuitive insight into the child's nature, and intense love for his profession, and also a thorough psychological training. All teachers should be thus equipped, and there would be no waning of interest in any subject, nor would there be any question of eliminating any of the old well-tried branches from the curriculum. A classicist well versed in psychology, pedagogy, primitive culture and philosophy would make the classic page glow with new light and interest. How far we are from this ideal is too painfully evident. As a people we do not love and reverence learning and culture—"there's the rub!" Teaching is not a crystalized well-defined profession whose members are known and appreciated everywhere for their great learning and deep culture. Consequently the vast majority of American teachers are social zeroes in their respective communities. We have been groping and experimenting and the children and the youth have been the victims of our bungling efforts. Well, how can we expect a young woman of eighteen or twenty, or even older, innocent of these higher qualifications that lend a unique force, charm and inspiration to the learning process, and who only looks upon teaching as a makeshift till she finds something more remunerative or gets married, to infuse vitality into the ancient author and make him live and breathe as a human being? As long as the teacher is not a complete living and loving embodiment of Greek or Latin, whose every nerve tingles with emotion and anxiety to impart that classic life of beauty and truth, so long these studies will grow deader and dustier until they are dropped in disgust.

However, we have good reason for believing that the deeper insight, the greater interest, the broader and more genuine sympathy for everything human, created by science, will also revitalize the classics. Science especially in co-operation with many other human interests, will ultimately unite all humanity past, present and future, into one vital, organic whole, every part of which will then be recognized as absolutely essential and hence will enlist future man's keenest interest as contributing to the fullest and richest fruition of life. In that day education will be under the best and strictest scientific guidance. Teachers will then be persons of erudition, deep culture, and native intuition, and most important of all, expert child psychologists respected and recognized as the most valuable servants of the state. Then every child will be carefully tested in well equipped psychological clinics, to ascertain its strongest instinctive capacities. Students who have no taste, love and ability for mastering literature, and are unable in their turn to become creative and productive in this field, will not be forced "like dumb driven cattle" through an extended literary course. In that day of clearer pedagogical vision, the brick-mason, the carpenter, the farmer, i.e., individuals best fitted by nature for these occupations, will not study Homer, Plato, Sophocles, nor Vergil, Cicero and Horace in the original. Why should we induce, or even allow so many undeveloped youth whose intensely practical, matter-of-fact minds care nothing for primitive thought and culture, who have no ear for the music of the classic writers, to spend so many weary profitless hours in such studies?

Last year the writer asked his students in Vergil the following question: What profit have you derived so far from your study of Vergil? One answer ran in part thus: "Modern literature is full of classical allusions which one must understand in order to gain the full force of that literature. The study of Vergil has made known to me a few of these myths. I cannot honestly say that the poem has any literary attraction for me. The construction is so complex demanding deep concentration of thought, I arise, after a siege of hours, with the same feeling which filled me when I had conquered a knotty proposition in geometry. I like the brain exercise, but I never find entrancing beauty and inspiring thought."

What an immeasurable distance between the attitude of our English poet Tennyson towards Vergil, who loved him since his day began, and that of this student! Can we honently persuade ourselves that a student to whom the form, feelings, spirit and thought of Vergil are so foreign and unattractive really *must* go to him for *brain exercise,* especially in our day when there are a thousand and one subjects to choose from of which Vergil never dreamed, subjects both practical, cultural, disciplinary and, last but not least, intensely interesting to this type of students? Even if we admit formal discipline for the sake of argument, why insist on these students studying the classics? The truth is sun-clear that education cannot create, but only bring out and make actual what is from the first potentially contained in the soul.

Two essential reasons why the modern college is not efficient, nor achieves its very best are: (1) that too many young persons are enrolled as students whom old mother nature did not give student brains, and these only hinder the work and encumber the ground of higher culture; and (2), owing to a wrong educational doctrine, too many students are permitted, and even induced, to pursue studies for which nature endowed them with rather meager or no capacity. This defect in our educational system should be remedied.

While waiting for this brighter, more perfect, but still distant day in education, the writer foresees a decline in classic and cultural studies properly so called. In the meantime there will be comparatively few who will seriously cultivate these branches and thus bring to complete unfoldment the perfect humanity, intended for many more by the Great Mother. These few who then keep the classic torch burning will consist: (1) of the deeper creative minds in art, literature and philosophy, who glimpse and ardently love eternal beauty and truth, the permanent, the ever valuable and worthy as it is mirrored in the spatial and temporal flux of things; these will be the real harbingers of the future superman,—Plato's beautiful harmonious personality, not at all Nietzsche's titanic monster with its absolute disregard of all human standards of mortality, even the most ideal; (2) of the merely recipient minds, the awakened and eminently esthetic souls who sincerely and earnestly desire to enjoy, and, in a measure, reproduce and re-experience the noblest and choicest fruits of human civilization.

ANCIENT VS. MODERN LANGUAGES AS A PREPARATION FOR ENGLISH

By Ralph H. McKee, University of Maine

One of the most persistently pushed reasons for requiring a knowledge of Latin for entrance to college is that an ancient language, particularly Latin, aids a student to acquire the ability to read, write and speak English better than does a modern language or the study of any other subject; this claim being based partly on the supposed close relation of Latin to English and partly on the supposition that the ancient languages are better taught than the modern.

In an examination of the dependence of quality of work in college upon the courses taken in the preparatory school, data bearing upon the above reason for requiring Latin for entrance to college were obtained. If this claim were true, then the student who had, in the high school, three years of Latin ought to receive higher grades in English in college than the student who had three years of a modern language or one year of Latin and two years of a modern language. These data were obtained from the records of the last three classes (1910, 1911 and 1912) graduated from the University of Maine. This institution has an advantage for such an investigation in that only two languages, Latin and French, are customarily taught in the preparatory schools tributary to it and also because all students, candidates for a degree, receive the same training in English in the freshman and sophomore years. After eliminating those whose entrance records were not available owing to their having entered with advanced standing, or as "specials," or for other reasons, and also eliminating those who did not complete a semester of college work, the records were tabulated in relation to the amount of language and its character and the grades obtained in English. In addition there has been included a column giving the average of all grades obtained by the student in all courses taken as an undergraduate.

Entrance Units of Foreign Language.	Number of Students.	General Average.	Average English Grade.
0 Years	12	77.80	77.20
2 Years			
2 M.	71	78.05	75.40
3 Years			
a. 2 A 1 M.	4	83.55	72.80
b. 1 A 2 M.	26	79.51	78.80
c. 3 M.	12	81.57	82.02
3.5 Years			
1.5 A 2 M.	4	79.92	77.64
4 Years			
a. 4 A.	8	79.72	76.68
b. 2 A 2 M.	49	79.43	80.39
c. 1 A 3 M.	15	81.26	81.10
d. 4 M.	20	78.99	77.05
5 Years			
a. 3 A 2 M.	26	81.28	79.54
b. 2 A 3 M.	17	80.03	79.64
5.5 Years			
3.5 A 2 M.	9	82.62	80.40
6 Years			
a. 4 A 2 M.	48	81.45	81.28
b. 3 A 3 M.	13	80.09	75.44
c. 2 A 4 M.	9	81.68	81.43
7 Years			
7 A.	10	81.50	79.34
8 Years			
4 A 4 M.	6	88.15	87.74
9 Years			
7 A 2 M.	7	86.76	86.06

"A" indicates ancient language, "M" modern language. Groups of less than four students were not considered. Modern language in the above is generally French though it includes 57 students who presented one to three years of German. Students with Greek, with the exception of one student, presented three years of that language. They constitute the groups presenting seven and nine years of foreign language. Students with no foreign language entered with conditions, students with more than six years language have almost all presented entrance units in excess of the number needed for full entrance.

If Latin were better than a modern language as a training for English then in each series the group "a" would have higher grades than the group "b" and group "b" than group "c." Exactly the reverse is found to be the fact and we must conclude that the advantage, if any, is slight and is in favor of the modern language. A slight increase in the quality of work in English as the total amount of foreign language training increases is also to be noticed.

The conclusions here reached agree with those of a similar investigation[1] made four years ago using a somewhat smaller number of students at Lake Forest University where the languages taken in the preparatory school were generally Latin and German, showing such differences as existed in their effect on the student's English to be in favor of German.

It is recognized that these facts tend to destroy a belief that is tender to many, but, like the belief in witchcraft or that potatoes grow best when planted in the dark of the moon this superstition that everything of scholastic value, including the ability to read, write and speak English, is dependent on the study of Latin seems destined to disappear. Latin deserves the attention of students but only on the same basis as other languages, an idea at variance with the custom of many eastern and southern institutions of requiring Latin as a prerequisite to the student's entrance upon a college course.

A study of the third column in the above table discloses that the students, who as a class enter without conditions and with no surplus of entrance credits, show in the quality of their general work no appreciable variation dependent on the amount of foreign language taken in the preparatory school. In other words, so far as preparation for work in college is concerned, it matters not whether the student in the preparatory school takes a large or a small part of his work in foreign languages, a conclusion in happy accord with the latest report to the National Educational Association of its committee on college entrance requirements.

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[1] *The Popular Science Monthly* for October, 1909.

A STUDY OF PROFESSIONAL WORK AS PRESENTED IN THE STATE NORMAL SCHOOLS OF THE UNITED STATES

By W. H. Sanders, State Normal School, La Crosse, Wisconsin

Data upon which this discussion is based were obtained by a questionnaire sent to all the state normal schools in the United States. The various normal school presidents selected faculty members who were most competent to furnish the information. Eighty-one of the hundred sixty-two schools located in forty different states representing all sections of our country are included in the study. The questionnaire called for information on five topics:

I. Professional Work Preceding Practice.
II. Observation.
III. Practice.
IV. Lesson Plans.
V. Effect of Practice Teaching on the Training School.

Lack of space necessitates the omission of data and limits discussion.

I Professional Work Preceding Practice

Sixty schools name Psychology as the first of the professional subjects. School Management is mentioned nine times while Special Method is named seven times as the first of professional subjects studied. We find Psychology taught in sixty-eight different schools; Pedagogy in sixteen; History of Education in twenty-eight; General Method in thirty-eight; Child Study in ten; Principles of Education in six; Principles of Teaching in seven; School Management in twenty-seven and Special Method in thirty-three. The total number of times that the remaining eleven subjects in the list are mentioned, varies from one to four, while two report no professional work preceding Practice.

If we study the subject " Psychology," which holds so large a place in so many schools in the training of teachers, some very interesting facts may be observed. In the first place the content of the courses in Psychology in the different schools as indicated by the text in use presents remarkable contrasts. A reading of the original reports also shows that in some schools stress is placed on Elementary Psychology, in others on Advanced Psychology, while Educational Psychology, Genetic Psychology and General Psychology are emphasized in others. Again in nineteen schools one hundred hours or more are given to the study of this subject; in thirteen schools between seventy-five and one hundred hours are given to Psychology; twenty-eight schools give between fifty and seventy-five hours; eight schools give less than fifty hours, while eleven are not reported as studying the subject at all. Furthermore, if we consider the number of hours given to the study of Psychology in the different schools as compared with the total number of hours study given to all professional work before Practice, we see what great importance some schools attach to Psychology as a factor in the making of a teacher, and that many other schools consider it as having but little or no value in this regard. In a word a student of these facts is impressed with the variety of views held by the different normal schools in what at first appears a substantial agreement. Certain it is that one interested in the training of teachers can not contemplate the diversity of procedure in the normal schools without feeling strongly that the problem involved in the question, "How much and what psychology is necessary in the training of teachers?" is, to put it mildly, in the experimental stage.

Other sharp contrasts may be noted in the work given before Practice in the various schools. While sixteen schools regard Pedagogy as essential, sixty-three do not; twenty-eight schools regard History of Education as essential, fifty-one do not give it at all; thirty-eight schools give General Method, forty-one do not; ten have a course in Child Study, sixty-nine do not; twenty-three schools regard School Management as essential, while forty-six do not; and thirty-three schools give courses in Special Methods, while forty-six do not. Are we to regard these extreme variations as due to conscious experimentation on the part of our state normal schools with a purpose to determine what are the essentials in the professional training of teachers? Or is it true that each state or each school under the direction of its president or board of control is proceeding along lines of its own choice, not taking into account the accumulated experiences of efficient normal schools in this and other nations? One school gives one hundred fifty-six hours to Psychology, one hundred fifty-six hours to General Method, one hundred fifty-six hours to School Management and seventy-eight hours to History of Education—a total of 546 hours. Another gives forty-seven hours to Psychology, sixty-six hours to General Method, sixty hours to School Management, and forty hours to History of Education—a total of 213 hours. Still another gives no attention to any of these subjects. If each of these schools is turning out efficient teachers we are forced to ask anew "What professional work, if any, is essential to the preparation of students to become teachers? If we regard the normal schools as being engaged in experimentation with courses of study it is pertinent to ask if the experiments are being carried on so as to furnish data that are sufficiently accurate to serve as a basis for the construction of courses along scientific lines.

II. Observation

In all save two of the schools reporting, Observation has a place though the extent to which it is used and the function it serves vary greatly. The number of hours (periods) ranges from none to two hundred with but few schools agreeing in the amount of time given to the subject. We find in some schools it is required for a given number of consecutive weeks, five periods per week, or it may be for one, two or three periods per week; again students are required to elect it before Practice or it is arranged irregularly, and in some instances it depends upon the "student's program." Generally speaking, Observation both precedes and accompanies Practice. In some schools it is carried on in connection with Psychology; in others it is a part of the course in Pedagogy, General Method or Special Methods. In one school it is arranged for by heads of departments; in another by the supervisor of practice, while in another, the critic teacher provides for it. The data above show that there is no consensus of opinion as to the functions of Observation in a normal school.

III. Practice

The number of weeks given to Practice varies from six to eighty. As a rule five periods per week are given to Practice Teaching, though a few schools give a half day or a whole day to the work. Multiplying the number of periods per week by the number of weeks given to Practice in the different schools, we may observe the following facts: Three schools offer fewer than fifty opportunities to teach; fourteen, from sixty to ninety; twenty-one, from one hundred to one hundred fifty; nineteen, from one hundred sixty to two hundred; and six from two hundred seventy to four hundred. Or, to put this variation in the amount of time given to Practice in another way, we may note that the following numbers represent the difference in opportunities offered to teach in the different normal schools: 30-45-60-65-66-72-80-85-90-100-105-120-125-130-135-144-150-160-180-190-195-200-270-285-300-400. The ratio of the largest number of opportunities to teach to the smallest number is approximately thirteen to one.

Using the data before us as a basis, let us ask what theory as regards the place or function of Practice Teaching is held by the state normal schools? It has been said that two theories as to the place of Practice Teaching are prevalent in normal schools. One group holds that it is the function of the school to give the student teacher an extended experience in teaching; the other contends that sufficient practice should be given to exemplify and vitalize educational theory. The data here submitted do not seem to support either of these contentions. The number of opportunities given student teachers to teach varies by irregular gradations from a minimum of 30 to a maximum of 400. This would seem to indicate that a variety of theories is held not differing materially from the number of normal schools represented in this investigation. To state the conclusion in another way, the data indicate the absence of any recognized standard theory as to the amount and function of Practice in our normal schools.

The supervisor of practice, the critic teacher and the student teachers are very generally expected to be present when a student is teaching. Occasionally the department head observes those teaching subjects in his department. In some of the reports a vigorous protest is made against the custom of allowing student teachers to observe other students teach. Since it is, in many schools, the custom to have the supervisor of practice teach classes in the normal school and since the critic teacher often sections her grades for student teachers, an interesting bit of information not called for in the questionnaire would be the proportion of time the student teaches unobserved. Hints here and there in this investigation show a pronounced sentiment against unobserved practice, especially in beginning practice.

One of the criticisms made on the normal school graduate is that he has had his practice under abnormal conditions. A point frequently urged is that the student does his practice with a small group of children and in a recitation room apart from other children at study. Out of a total of seventy-one schools, thirteen require their student teachers to teach in the presence of classes engaged in study; twenty-seven schools use the recitation room; and thirty-one schools allow the student teachers to use a recitation room at the beginning of Practice but later require the teaching to be done in the assembly room. The presence of the recitation room may be due to preference for this plan in some instances, but in many places it is accounted for because of a desire to increase the practice facilities—to provide more practice even though under abnormal conditions—beyond what might be available in the rooms presided over by critic teachers. The relative worth of much teaching done under very abnormal conditions with only occasional supervision, as compared with less teaching done under conditions more nearly normal and close supervision, is worthy of careful study. Since Practice Teaching at best is artificial, done under conditions not ordinarily found in public schools, would it not be well to make this part of the student's preparation for teaching conform as nearly to actual school room conditions as possible?

IV. The Lesson Plan

Eighty out of the eighty-one schools furnishing data use a written lesson plan. Fifty-seven out of a total of seventy-two schools follow a definite form of plan which is practically the same for all subjects and for all grades. Summarizing the essential points in a lesson plan as indicated by the different schools we have a total of forty-one. The number of "essential" points varies in the different schools from one to seven. The fifty-seven schools that use a definite form of plan show extreme variations as to what constitute the "essentials" of the plan. This difference of opinion raises the question as to what are the really "essential" points in a lesson plan. Is it advisable to leave the "essential" points to individual supervisors or critics as reported by some schools? Does the absence of agreement in any school on "essentials" encourage individuality as indicated by other schools? If the lesson plan hampers worthy individual activity should not the entire scheme be abandoned? The almost universal use of the written lesson plan in normal schools indicates that it has a place in the training of teachers, but the data show that the lesson plan has not had the careful consideration necessary to make it yield its highest service.

The query relative to the psychological processes taking place in the minds of the pupils in mastering problems had for its purpose (a) to ascertain to what extent normal schools seek to make the teachers in training conscious of the actual thinking which their children must do and (b) to find out whether this activity of the pupils is indicated explicitly in the plans. Almost every conceivable variety of opinion was expressed on this question, ranging from strong commendation to vigorous condemnation of the idea that the processes should be shown. The answers are extremely interesting and incidentally throw a flood of light on our ideals of what constitute efficient training of teachers. I quote two replies as showing extreme views: " We do not know of any psychological processes ", and " The supervisor ought to know that the teacher understands the processes the child performs in mastering the lesson. Should be in lesson plan if not told orally."

Considering the importance of the mental activity on the part of the pupils, that this is the end for which teacher and subject-matter are employed, it seems logical that this activity should be conceived clearly and stated plainly, so that a critic or supervisor might see at a glance whether subject-matter and procedure are in harmony with this end. To take the view that the mental processes of the pupils should be *implied* in the plan, that the *procedure* should reveal them, is to assume that the student teacher is clearly conscious of the processes which a well-directed question by the critic will show is often not true, and to expose the supervisor or critic to the danger and temptation to read his own thoughts into the plan rather than to ascertain the student's exact view of it. A critic teacher of experience may see implied in a line of procedure much that a student teacher of little or no experience would be wholly innocent of. It seems, to avoid doubt and uncertainty as to whether a student teacher sees the end to be accomplished, it would be well to have this definitely stated in the plan. The plan should show explicitly rather than implicitly, the activity which the teacher proposes as a result of his procedure.

Let us not be misunderstood in this discussion. It is conceded that a real teacher of experience may adjust his subject-matter and procedure *unconsciously* to the ends to be attained. But it is far different with a student teacher with no or with little experience. The contention is here that in the case of the latter he should be made to see clearly the activity to be stimulated, that this should stand in the center of consciousness, in the spot light, so to speak, and that he should consciously shape his material and procedure in harmony with this end. Habit comes from repeated conscious effort—" repetition in attention "—and if the beginning teacher is to grow into the habit of shaping his work to meet certain ends automatically or even with a low degree of consciousness it must be in accordance with the well known laws of habit. Those upon whom the burden of making lesson plans is imposed are beginners, they are novices and need to be given right habits from the first, if they are to develop into graceful, skillful and efficient teachers through practice.

V. Effects of Practice Teaching upon the Training School

A small majority of the normal schools express the opinion that there "are no detrimental effects of practice teaching upon the training school," at least none that are not greatly mitigated, if not entirely overbalanced by "the strength of the critic teacher always present." A strong minority of the schools, however, see unmistakable evidence of deterioration when the student teachers begin their work. "Too many personalities," "too much thinking for pupils," "want of concentration," "discipline more lax," "knowledge not definite," "signs of disintegration," "continuity suffers" "unable to get as much work done as in good public school"—these are the injurious effects most frequently mentioned as arising from the work of student teachers.

Those who see evil effects of practice teaching in the model school attempt to counteract these in a variety of ways. "A strong critic teacher" "always in charge" "teaches much of the time" "especially when any deficiency appears in the pupils." "Change practice teachers frequently" "and permit no one to continue teaching if failing." "Careful supervision of plans and daily conferences of student and critic teacher in which failures are forestalled—"a careful sifting, gradation and *prerequisites* for teaching" together with "a balancing of weak and strong students" and care in "changing student teachers to grades to which the student is better adapted"—are suggested means of protecting the model school from the evils of Practice.

VI. Conclusions and Suggestions

The data show:

1. State normal schools have not grasped clearly and made effective in their curricula the thought that there is a Science of Education.

2. Under the most diverse lines of procedure in Psychology, Pedagogy, Method, Observation and Practice the normal schools believe teachers are being trained equally well.

3. Individual schools proceed along independent lines, not taking into account sufficiently the experience of this and other countries in the training of teachers.

4. There is no well established and generally accepted theory

of normal training or body of educational principles, developed in sufficient detail to be usable, according to which normal schools are working.

5. Normal schools, as a class of educational institutions, created for a distinct purpose, can not hope to escape severe criticism so long as they pursue the unscientific policy now in vogue.

6. There is among normal schools no recognized *best* way to develop a student into a teacher.

7. Courses, for example in Pedagogy, Psychology and Method, are not based upon a well wrought out and definitely organized body of ideas but upon texts in which there is the widest possible divergence in subject-matter.

8. Normal schools as a class are not living up to their highest opportunity.

9. The nomenclature used in these data (and in Pedagogical literature in general) is so loosely used, used with such a variety of content, that it is difficult to discuss educational questions even in the presence of a body of educators, so as to be clearly understood.

In view of the purpose for which state normal schools were created, in view of the divergent and opposing lines of procedure existing in them, in view of the great opportunity which they have and the enormous expense at which they are maintained, the whole matter of normal school education should be referred to a Commission of Educational Experts of such commanding ability that their conclusions would have weight and carry convictions to those who control these schools. If such a Commission would give us a clear statement of the principles underlying the Science of Education and the Art of Teaching; a carefully considered scheme of Normal School training involving the quantity, quality and order of subject-matter and the method of presenting the same; and make a thorough study of the function of the Model School and of its relation to the normal school, they would render a service worthy of the best efforts of our most able experts in the field of educational endeavor.

BIBLIOGRAPHY

1. ALBEE, G. S. Condition of Psychology in Normal Schools. Proc., N. E. A., 1887: 495-504.
2. ALLEN, C. H. Training Schools as an Adjunct of Normal Schools. Proc., N. E. A., 1888: 496-503.
3. BENDER, WILBUR H. The Organization and Function of the Training School in the State Normal School. Proc., N. E. A., 1903: 219-224.
4. BENEDICT, M. K. Direct Use of Psychology in Teaching. Ed. Rev., 1905, 30: 201-206.
5. BOLTON, FREDERICK E. Original Investigation in Normal Schools. Education, 1900, 20: 548-556: 603-612.
6. CLARK, WILLIAM ARTHUR. The Pedagogical Laboratory in the Scientific Study of Education. Proc., N. E. A., 1907: 747-752.
7. Committee of Fifteen, Report of. Ed. Rev., 1895, 9: 217-229.
8. COOK, J. W. The Kind and Amount of Practice Work and Its Place in the Normal School Course. Proc., N. E. A., 1895: 501-509.
9. —— ——. Practice Teaching in Normal Schools. Ed. Rev., 1892, 3: 267-269.
10. COOK, G. L. The Training of Teachers in Great Britain. Proceedings of the New York State Teachers Association, 1908: 117-123.
11. DE GARMO, C. What Constitutes the Professional Work in Normal Schools. Proc., N. E. A., 1891: 710-724.
12. —— ——. German System of Normal Schools. Proc., N. E. A., 1887: 484-492.
13. DUTTON, LARKIN. Practice Teaching in Normal Schools. Ed. Rev., 1891, 2; 261-264.
14. FELMLEY, DAVID. The Relation of Heads of Departments to the Training School. Proc., N. E. A., 1902: 530-534, and discussion following.
15. —— ——. The Normal School and the Training School. Proc., N. E. A., 1911: 700-704.
16. GIBBS, DAVID. The Normal Training School. Proceedings of the New York Teachers' Association, 1908: 136-146.
17. GRAY, THOMAS J. Methods of Instruction in the Normal Schools of the United States. Proc., N. E. A., 1887: 472-480.
18. GREENOUGH, J. C. Training Schools in Connection with Normal Schools. Proc., N. E. A., 1874: 229-233.
19. GUPTILL, FANNIE S. The Value of Practice Work in a Model and Training School. Proc., N. E. A., 1893: 391-398.
20. HALL, JOHN W. Professor Rein's Practice School at Jena and Its Lessons for American Normal Schools. Proc., N. E. A., 1896: 644-649.
21. —— ——. The Relative Importance of Practice Teaching in the Normal School. Ed. Rev., 1899, 18: 292-297.
22. HALL, G. S., and RUSSELL, E. H. In How Far May Child Psychology Take the Place of Adult or Rational Psychology in the Training of Teachers? Proc., N. E. A., 1904: 568-571.
23. HARWOOD, SAMUEL E. The Training School as a School of Observation and Practice. Proc., N. E. A., 1909: 557-561.
24. HILL, JOSEPH H. The Distinctly Professional Content of Normal School and College Courses. Proc., N. E. A., 1910: 564-568.
25. HILLYER, THOMAS A. The State Normal School Training Department. Educa., 1907-08, 28: 67-75.

26. JONES, L. H. The Relation of Observation to Practice Teaching in the Preparation of the Young Teacher. Proc., N. E. A., 1908: 728-735.
27. KEITH, JOHN A. H. What Relation Should the Head of Theoretical and Scientific Education Sustain to the Practice Schools? Proc., N. E. A., 1908: 723-728.
28. LATHROP, DELIA A. Training Schools: Their Place in Normal School Work. Proc., N. E. A., 1873: 180-189.
29. MARTIN, E. Historic Development of Normal Schools in France. Proc., N. E. A., 1893: 415-418.
30. MCMURRY, DR. FRANK. Training Schools—Theses. Proc., N. E. A., 1899: 845-854.
31. MILNE, WILLIAM J. The Value of Practice Teaching. Ed. Rev., 1892, 3: 69-71.
32. PAYNE, WILLIAM H. Practice Teaching in Normal Schools. Ed. Rev., 1891, 2: 366-368.
33. —— ——. The Training of the Teacher. Ed. Rev., 1898, 16: 469-479.
34. PUTNAM, DANIEL. What Aspects of Psychology and Child Study are Suitable Subjects for Instruction in Normal Schools? Proc., N. E. A., 1902: 239-242.
35. REIN, W. The Spirit of the Practice School. Ed. Rev., 1897, 14: 259-262.
36. RUEDIGER, W. C. Tendencies in the Normal Schools in the United States. Ed. Rev., 1907, 33: 271-287.
37. —— ——. Professional Work in State Normal Schools. Educa., 1906-07, 27: 174-179.
38. ROBERTSON, C. B. The Function of the Training School: Its Relation to the Department of Principles of Methods. Proc., N. E. A., 1909: 561-570.
39. ROUNDS, C. C. Report on Practice Work in Connection with Normal Schools. Proc., N. E. A., 1885: 429-436.
40. RUSSELL, E. H. Practice Teaching in Normal Schools. Ed. Rev., 1891, 2: 476-482.
41. SALISBURY, ALBERT. Teacher-Training in Great Britain. Proc., N. E. A., 1909: 573-579.
42. SANDISON, HOWARD. The Real Province of Method. Proc., N. E. A., 1895: 694-700.
43. SEERLEY, H. H. The Problem of Practice Teaching. Ed. Rev., 1897, 14: 375-379.
44. SHELDON, E. A. The Practice School as a Public School. Proc., N. E. A., 1896: 651-659.
45. SNYDER, Z. X. The Training School in the United States. Proc., N. E. A., 1898: 751-755.
46. STOUT, KATE E. Organization of Training Schools and Practice Teaching. Proc., N. E. A., 1895: 700-706.
47. THOMAS, A. O. Status of Normal Schools in Education. Proc., N. E. A., 1908: 704-710.
48. WILKINSON, J. N. The Organization of Practice Teaching in Normal Schools. Proc., N. E. A., 1895: 707-709.

PREPARATION OF TEACHERS FOR NATURE STUDY AND CIVIC BIOLOGY*

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All things considered, progress in the teaching of elementary public school biology has been phenomenal in the last ten years. Millions of boys and girls are now alive and awake to the study of birds and insects, gardens and soils, flowers, trees, weeds, corn, cotton and tomatoes, who would have been dead or asleep to all these interests under the old regime of ten years ago. Under the law of momentum and acceleration, progress in the next ten years is bound to be even better. The field is as infinite as Nature and simply teeming, abounding, bursting with knowledge and possibilities of life and education, all wholesome, all worthy and delightful, and all worth while. We are only in the dawning fringe of a new era of cleanly living and splendid good health full of beautiful homes, glorious, gorgeous and luscious gardens, teeming fields and shady roadsides, green pastures and still waters. Verily in this work is the Lord our Shepherd and we shall not want.

Nothing gave me more pleasure and genuine satisfaction in my travels of the past summer than the glimpses I got of children's gardens everywhere. The world is surely moving in the right direction. They were everywhere, roof gardens, window gardens, back-yard and front-yard gardens, school gardens, garden cities, and everywhere there were children in them, standing and looking, bending over and pointing out things to companions, gathering vegetables and flowers. Among many others, I visited the garden of one little girl in Cleveland; it occupied part of a vacant lot next door to her home and was fifty feet square. Early in August it was a mass of bloom, asters and sweet peas, lilies and roses, with wonderfully well-grown tomatoes, lettuce and other vegetables at the rear. This was the third year she had had this garden and every plant in it seemed perfect. The first year she had sold about $20 worth of flowers, plants and vegetables from her garden, the second, $60 worth, and so far this year she had actually sold $125 worth and hoped to bring the account up to the $200 mark before winter; her garden looked as if she would. Think of it! This is already at the rate of $1975. per acre, and if she succeeds in her ambition the yield will be at the rate of $3160. per acre—and by a slim, little slip of a girl fifteen years old. But in all the garden the finest and best crop is the knowledge, and interests, the ideas and ideals in the life of the girl herself. She was glowing and sparkling with love of her garden. She has developed strength of body and of mind, power to concentrate and patience to persist until the result is in hand, resource and ability to plan wisely and to work out the problems in her way. She has made a good start on the road to knowing how to produce her own living by fundamental and wholesome industry. No matter where her lot is cast, she will be better able to surround her home with the wholesome comforts and beauties of the garden; and what a teacher she may be in a few years.

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* Address delivered before the Wisconsin Teachers' Association, Nov. 7, 1912.

All this progress has meant change in subject matter, growth in ideas and advance in methods on the part of teachers. A whole new field, the whole out-of-doors, has been thrust upon them to teach. It is one thing to teach the easy little lessons in the easy little printed books and quite another matter to study and learn together with the children and try to teach the big book of nature. Far too little thought has been given to this phase of our problem—teachers expected to teach children to garden who have themselves never so much as thought of planting a seed of any kind; to lead their pupils in bird study, who have never learned to tell a crow from a crocus or a hawk from a handsaw; to teach the trees, who have never been taught rightly a single common oak or maple; and to teach insects, who have never dared to look a single bug in the face. All this infinite wealth of nature dumped on them to teach, on the one side; on the other, courses and equipment, gardens and other facilities and opportunities for study at first hand in the normal schools of ten years ago, in which most of the teachers in the harness to-day received their preparation, utterly inadequate or even absolutely nil. The public is making these demands on the teachers, and nothing can be plainer than the simple, common-sense proposition that the public must supply adequate instruction and equipment for their preparation to teach.

Two propositions thus become clear at the outset. We must adequately reorganize and equip our normal schools with laboratory, greenhouse and garden facilities, properly to fit teachers of the present and future; and, of even more moment just at present, we must offer every possible help and encouragement to the teachers already out in the work. This may be done through educational journals, State nature study and biology leaflets, and really helpful, practical and inspiring lectures in institutes and the summer schools. Wisconsin has already set the pace in its Arbor and Bird Day Annual, a model of both inspiration and instruction; a happy union of art and science. Be liberal, the subject is well worth all we can possibly afford to spend on it, even in money, and much more in life. To require bricks without straw was an outworn policy five or six thousand years ago.

Teachers cannot be prepared to teach nature study by unkindly criticism. The first thing one is likely to hear when instruction in some new field is discussed is: "The teachers don't know anything about it." And this is too often said as if they ought to know. Fortunately, nature is too infinitely vast and manifold for anyone to know it all, and the more one really knows the humbler he becomes and the more careful of the feelings of others, because he realizes how little of the whole he ever can know and how dependent on others he must always be for what they may have been able to have learned. Hence, the best preparation to teach is the humble spirit, eager to learn but free and even glad to tell another "I do not know." And why not give the pupil the pleasure of finding out and telling? Nature study reduces to instant absurdity the silly, shallow notion that the teacher ought to know everything. The sum of the knowledge of nature of all mankind, all learning, all science for thousands of years, is only a minute fraction of what remains to be discovered. If everybody knew everything, what a pretty pickle we would all be in! Nobody would have anything to tell anyone else and human society would be on a level with a bank of jolly little clams in the mud.

A friend returning from abroad told me that a well-to-do Frenchman in Paris had asked him: "Well now, is America in New York, or is New York in America?" I was perfectly delighted to hear it. How well I remember the endless, dull, deadening grind of geography in the district school—the wearisome map-making, the everlasting parrot-like telling over and over of boundaries, cities, rivers, mountains, industries and productions. That was some years ago, of course, but I've been told that it is a hundred times worse and more of it now. Oh, man is the only animal on the face of the earth that compels its offspring to learn for the pure torment of learning. From all this dull black misery of useless memory cramming just one bright star, to me a star of hope and inspiration, shines in my soul even to this day. One teacher, her name was Miss Hunt, the only teacher I ever had whom I really loved and would run my little legs off to do, fetch or find anything for, Miss Hunt told us that she *did not know the source of the Nile!* that a great many had tried to find it, but could not, that she did so wish somebody would discover it. This was the only thrill I got from all the years of geography. It kindled my infant soul and I vowed then and there, "when I got big," I would discover the rising-place of the river Nile.

In nature all about us, however, we have thousands of things of more vital interest to us than the discovery of the sources of the Nile. Why not tell our children that we wish they would find them out and give us all they are able to discover? This attitude and spirit would mean the very breath of life to our whole system of public education. Why is it that Louis Agassiz is the intellectual father or grandfather of every biologist in America? Because he told his students what he did not know and asked them to find out and tell him. And then:

"His magic was not far to seek, he was so human."

If there was just one element in preparation of teachers for this work that I could have each one possess for the asking it would not be, that they wear themselves to the bone trying to learn everything in creation, but that they become "as little children," saturated with the spirit of little children and come to heartily enjoy studying and learning together with their pupils. Of such, verily, is the kingdom of the heaven of nature study. From what a burden of cram and sham, pretence and bluff would this not set us free, if every teacher in the land could be glad to say: "I do not know. Does anyone in the class know just the best way to plant a grape vine? Who will volunteer to find out all about it and tell us?" Comfortable and vital honesty between teacher and pupil will be the instant result; they will be truly and sincerely working out their problems together, and not until this blessed condition is secured can we hope to have the best teaching of science.

The definition of "Science" as "classified and arranged knowledge," cut and dried hay of the mind, baled and mowed away in books—may have some meaning to the adult who works with it; but it is utterly dead to the child. Lessing's definition of Science as "The eternal struggle of the human mind after truth" is the only one a child can understand. The quest, the hunting, the "struggle" is the thing. We rack our poor brains to invent puzzles, artificial and trifling, while here all about us are the "Riddles of the universe"—all tingling with vital significance. To solve them is what we are here on this earth for—lessons set us to learn in three score years and ten. Lessing saw the point clearly when he defined science, and he says, as you know: "If God were to hold before me the truth itself in His right hand and the struggle to find it out in His left, and ask me to choose, I would humbly bow before the left hand and say, O Lord, for Thee alone is truth, give me rather the struggle." Every child, and everyone else who is not a book-word eating, mental parasite, would do the same.

This, then, is the first great essential in preparation of a teacher—the ability, the knack, the spirit of working out problems with the pupil. Compare in effect on the class such assignments as the following: "To-morrow you will commit to memory and recite pages 21, 22 and 23" and: "Come on, let us all study this and see who can find out most about it and each may have the chance to tell what he has learned in the class to-morrow."

Knowledge with this spirit and attitude is wisdom—above fine gold, rubies and diamonds—which draws all men to itself. Knowledge without this spirit and attitude is sure to be disagreeable, uncomfortable, of the kind that "puffeth up," which repels and tends to separate pupil and teacher.

This spirit germinated in Froebel and Pestalozzi. It seems to be beginning to bloom, perhaps more especially, in Montessori, in all whole-souled, active education, agricultural and industrial. It is bound to permeate and dominate every fiber of our educational life and bear the rich fruitage of paradise re-won in the earth. "Come on in," the educational water is fine. It is the river of the elixir of life, a veritable fountain of eternal youth: for true delights of nature never grow old. One of the first fruits of this spirit must be to make teaching the most vitally joyous of all human occupations, next, at any rate, to actual home-making, as it leads us back to the most ancient altar of life, the primal source of our profession, the love of mother and father, working together with their children. And this spirit, springing, perhaps, more naturally, out of these primeval and original relations of nature and life, must come to vitalize and leaven the whole lump of our public education. "Come on in," this water of life is fine.

Yes, but, do you say, "you must tell us how." What! Don't you know how to swim, mentally and spiritually in the water of life and truth, as well as physically? Do you stand shivering on the bank of book knowledge, afraid to take the plunge into vital, thrilling sparkling reality? Must I pick you up bodily, or rather, spiritually, and duck you in it? Well, if I must, I must.

Huxley never spoke a truer word; indeed no truer word has ever been spoken in education than this: "Knowledge gained at second had from books or hear-say is infinitely inferior in quality to knowledge gained at first hand by direct observation and experiment with nature." We have always, everybody always and everywhere has a proverbial distrust of "book larnin," but until recent years how much of any other kind of "learning" have we had in our public schools? Even yet the toils of the books threaten to crush and strangle the life out of our education, like the serpents of the Laocoon group. With the apple trees in full bloom all around them a teacher asked her class to write a description of an apple tree. The class gathered about at the close of the lesson and asked her for references to books on the apple tree. She told them to refer to the apple trees. The results, however, showed that they all went to the library and copied their descriptions out of books.

Dr. Jean Dawson, of the Cleveland Normal School, has just made a remarkable series of tests for knowledge of the most common out-door things, remarkable, I mean, in showing present conditions. About seventy specimens—staple grains, beans and common vegetables, common household plants and branches of common trees—were numbered and passed around the class entering the Normal School, graduates of the high schools and even of colleges. The specimens were large and typical and the pupils handled them at will and were not hurried in their work. A few typical cases follow:

2% did not know shelled white beans.
20% " " " bean plant.
4% " " " clover, of any kind.
10% " " " a dandelion plant.
67% " " " a radish plant.
91% " " " a parsnip plant, with little parsnip.
44% " " " a potato plant, with little potatoes.
22% " " " a tomato plant, with blossoms and green tomatoes.
52% " " " a lettuce plant, with roots, leaves and head.
51% " " " a squash vine.
60% " " " a cucumber vine, with leaves, blossoms and little cucumbers on it.
79% " " " a burdock.
92% " " " a ragweed.
79% " " " wheat in head.
43% " " " wheat kernels in hand.

The figures might indicate that these students have a low grade of intelligence or that such material was not common in their environment. Neither is the case. An average of 85% standing is necessary for admission to the Normal School. Cleveland is known as the "Forest City" and is truly a city of homes and gardens. All the specimens were gathered within a few rods of the school building and grew, many of them, in profusion everywhere. One of the young ladies had always had a garden at her home and spent many of her summers on a farm, where all the specimens on which she was examined grew in abundance, but her average was no higher in the test than the other members of the class. Although her average standing had been 91 in high school and she had spent one successful year in college, she did not know an elm, apple or plum tree, could not recognize a raspberry or blackberry bush, a melon or cucumber vine, a carrot, parsnip or potato plant, although she had picked up five bushels of potatoes once on the farm. She knew oats only in the head and could not recognize wheat either in the head or after it was threshed.

Dr. Dawson explains this whole condition of mind and knowledge through the lack of developing the senses by first-hand observation. Everything practically for years has been learned from books, books, books. The statement of a problem out of doors means nothing to such people, and this renders live teaching at this late stage extremely painful and difficult. The remedy for this senseless, thoughtless, condition is clearly, insistence upon lessons and first-hand work with things of nature, daily in the home and in school from the kindergarten up. A few minutes a day and a little direction and encouragement is all that is necessary to stimulate and develop invaluable powers of observation and give a clear knowledge of all the common things about the home. While the above data were gathered in Cleveland, other cities are probably in even a worse condition. We must face things as they are. Here is the finished product of our public schools. The fault lies in the system, not in the pupils. What are we to do about it? Get them all in the water of real life working out problems with interesting and vital things and keep them alive and growing.

Typical illustrations will be given later, but before doing so we must suggest two other important lines of preparation.

After the spirit we must have the body and the mind for the work. Given the spirit, the body responds, and we must have strong, sound, vigorous bodies. We must be able to enjoy, fairly to revel in out-door things.

> "As the bird wings and sings,
> Let us cry, 'all good things
> Are ours, nor soul helps flesh now, more than
> flesh helps soul.'"

We must have clear, well developed senses and strong hearts.

> "Eyes, ears took in their dole,
> Brain treasured up the whole;
> Should not the heart beat once
> 'How good to live and learn?'"

It requires real bodily ruggedness and vigor to say from the heart:

> "Then, welcome each rebuff
> That turns earth's smoothness rough,
> Each sting that bids nor sit nor stand but go!
> Be our joys three parts pain!
> Strive, and hold cheap the strain;
> Learn, nor account the pang; dare, never
> grudge the throe!"

Bodily aches and pains, sicknesses of all kinds, are rapidly coming to be recognized for what they are—punishments for errors, mistakes or even crimes against one's self. The first duty of life, biological, educational, social, is to keep the bodily machine up to top-notch efficiency. Keep strong, sleep long, breathe deep, eat right, and we shall have bodies sparkling with euphoria and bubbling over with good health and vital with the will to do good work; bodies capable of carrying the spirit joyfully every step to tops of mountains and through hard days' works. We need and must have in all normal schools and wherever teachers are trained such practical courses in hygiene and physical culture as will make our teachers an inspiration for good health to every school child in the land. In my experience most of the sourness and grouch in school work—I am tempted to say all of it—is due to physical weakness and ill health, and consequent ill-nature and irritability on the part of teachers, or that of the few defective or ill-kept pupils who are so apt to make life a burden to the teacher and the whole school.

Properly prepared themselves, teachers will be able to safeguard the health of their pupils and thus nature study and civic biology in the high school may be made to serve as the really vital foundations for the conservation of national health. Properly prepared for it, our teachers could set us well forward toward saving our billion dollar tax now annually paid to preventable disease. Nature study and civic biology should be the corner stone of national vigor and health conservation.*

If we make this instruction really good enough, we reach bad health conditions in the homes as we can in no other way. One girl writes Dr. Dawson: " The biology course revealed so many interesting things to me that sometimes I could hardly wait until I reached home to tell my mother. The knowledge of civic biology was so badly needed in our home that it was impossible for me to keep quiet on the subject." And the " mother " in question testifies that the family got almost as much benefit from the course as did the daughter.

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* See in this connection a brief paper by Dr. Jean Dawson: Some Effects of Civic Biology in the Home, *School Science and Mathematics,* 1912, pp. 313-321.

Of course, all such divisions are recognized as artificial, but, given the true spirit and a strong, resilient body, the third element in adequate preparation—a strong clear mind—is apt to be a natural consequence of the other two. By this I mean mental vigor and resourcefulness which gives the teacher power to use materials at hand, the elements and opportunities of the environment, and organize them into just the course in nature study or civic biology which the community needs. This is the diametrical opposite of that deadening " preparation " which so often leads the proverbial normal student to cry out: " Dear teacher, I have come to the end of my note book, What shall I do? "

In this work, as nowhere else, we need clear-headed common sense. I know a school superintendent who in visiting his country districts attempted to stimulate interest in nature study about as follows:

> " How many of you boys and girls have ever seen a frog? " (Every hand in the room *up*.) " Yes you all know the frogs, I see. How many of you boys and girls ever saw a frog *wink*? " (Every hand in the room *down*.)
>
> " What! Not one of you ever saw a frog *wink!* Well, for country boys and girls I am ashamed of you. Next time I come around I shall expect you all to be able to tell me how a frog *winks*."

He lost his job. His districts were in an uproar. People were not slow in telling him that they did *not* send their children to school to learn how *frogs winked!* Everything that went by the name of " nature study " suffered in consequence. One little girl was seen bringing hands full of grains from her father's barn.

> Her father: " What are you doing with that? " Girl: " Teacher wanted me to bring samples of grains to school for our lesson in nature study."
>
> Father: " You take that stuff right back into the barn and leave it there, and you tell your teacher that I don't send you to school for any such tomfoolishness."

In the same neighborhood the question: " What kinds of insects and how many will a toad eat for a meal? " set the child population studying and protecting toads, and the good work restored nature study to public favor.

So here the aim of education is not stuffing the memory with useless information but developing common sense, mental resourcefulness, to study out and work out whatever it is worth while to teach and to learn. The intelligent part of the public, at least is ready entirely to relieve the teacher of the impossible task of trying to know it all, if only he will teach the children in common sense fashion how to find out what they really need to know.

We have purposely not stopped, till now, to differentiate between nature study and civic biology. The sphere of nature study is the life and needs of the child in the home. Civic biology consists in those problems that require united action of the community to solve. The two fields are naturally very closely related—*i. e.,* if the life of all the homes were ideal the life of the community would be. The nature study point of view is to teach the child what he needs to know. The scientific point of view is to teach the subject. If the scientific student cannot master the subject, he has no call to study science. This line of cleavage is thus perfectly clear between educating citizens and intructing specialists, and even specialists ought to be men and good citizens before they become specialists. The line between nature study and science ought to fall clearly between the high school and the college. It is an advantage, however, to change the name of the course in the high school to "Civic Biology" in order to emphasize preparation for active citizenship.

The trouble with our high school biology in the past has been, and, I fear, still is, that the teachers are trained in college and university and, knowing nothing else, attempt to adapt the college course to the high school. Indeed, most of the textbooks written by college or university men for the high school fall into the deep old ruts and turn out to be college texts. Here is a clear point of view which at once relieves us of college domination. It says: admit no topic into the high school course that is not clearly demanded by the best life of the community, and with this criterion any teacher of sense and resource can organize his own course to fit the needs of his community.

It will not be difficult to choose two or three type topics which will illustrate this spirit and method for both nature study and civic biology. Any one of a hundred different insects—which will continue to cost the country more than a billion dollars a year, until we study them and learn to combine both home and civic effort to control them; any one of a dozen common microbes—which impose our insufferable burdens of preventable sickness; any one of two score garden, home, orchard or farm fungi, moulds, blights, mildews, smuts, or rusts; the study of birds or gardens, trees, flowers, fruits, nuts; or anything vital to home and community life might serve as well as those selected. Outlines must be the briefest possible but any teacher can fill in between the lines.

MOSQUITOES

PURPOSE.—To study the problem with the view of relieving the homes, public parks, streets and school premises—the entire town, city or neighborhood—of the pests.

METHOD.—Begin by finding out what the pupils know about:
a. What mosquitoes do, bite, annoy, inoculate with malaria, chills and fever, or with yellow fever, lower value of land where they are numerous.
b. Different kinds of mosquitoes. Common rain-barrel or Culex, malarial, Anopheles, or yellow fever mosquitoes.
c. Life history: the eggs and wrigglers, larvae and pupae, of different kinds in neighborhood, habits, and places where they are found.
d. Hunt for breeding places about school premises and, by each boy or girl, around the home (if in a high-school class, in all parks, public dumps, streets, in gutters and catch basins, public reservoirs and the like). Maps showing extent and distribution of breeding places.
e. Methods of dealing with the breeding places—screening and oiling of rain barrels and cisterns, keeping clean, desirable waters stocked with fishes and keeping the shores clear of weeds and pockets of stagnant water, draining or filling undesirable water, or, if this is not possible, covering it with oil, whenever the wrigglers appear in it.

A little timely, well-organized instruction in all the grade and high schools, with appropriate aid of the local papers, which always gladly cöoperate, and we gain an advance in home and community life. Special attention to the sewers and catch basins is apt to be the last move on the enemy, and that can be taken by the local board of health or by the sewer department.

THE HOUSE FLY

PURPOSE.—To promote health and cleanly living and relieve home and community life of this time-old plague.
METHOD.—Bring out by question and answer importance of the subject:
a. Annoyance, filth in foods, fly-specking of the windows, chandeliers, ceilings and woodwork. Cost and labor in cleaning up the filth of flies.
b. Filth—disease infections carried by flies—typhoid cases in neighborhood, summer complaint of infants, ditto, tuberculosis, ditto, any others? (500,000 cases of typhoid yearly for the country with about 50,000 deaths, one third of which, probably due to flies. Forty-nine thousand infants die under two years of age, and 7,000 over two

years, by filth infections of acute dysentery; number of tuberculosis cases, unknown.)

c. Different kinds of flies, known to the class? (There are 43,000 species of flies known in all.) Distinguish house, or typhoid fly by appearance, habit, veining of wings—with a magnifying glass. Learn to know the stable fly, the fly, that bites cows and horses and people, in the same way. (This fly has just been convicted of carrying infection of infantile paralysis).

Fly screens disagreeable and expensive. Cost for different families per year. (Expense for U. S. annually, estimated at $12,500,000.)

d. Life history: Number of eggs laid by a fly? Where laid? Maggots, found in horse manure and all sorts of decaying animal or vegetable filth (Professor Forbes bred horse flies out of snuff from a druggist's counter.)

Since eggs are laid *before* material is put into manure boxes or pits, it does little good to make these places "fly tight," and is very hard to keep them so.

Maggots hard to kill—experiment in school-room with kerosene, strong alcohol, copperas, lime, other chemicals. (Buried six feet deep, Stiles found that they worked their way to the surface.)

e. Foods of adult fly? Substances that attract them most strongly? Distance flies travel? Most effective means of killing adult flies? Best traps? Poisons? Out-door methods of extermination?

f. Plans for enlisting every member of the community to keep his premises free from flies? Experience of other places? Flyless homes and cities?

A GRAPE VINE

The grape has been cultivated since prehistoric times. The suggestion is often made that it may have been the first plant to be selected, to attract the attention possibly of some primitive boy or girl, and be planted or encouraged to grow and be trained over the home of man.

Among the many wholesome garden interests here is one of more permanent relation to the home. A grape vine can be obtained for the price of a package of seeds or a bulb and it will live for centuries. No plant is more easily grown or possesses greater aesthetic, educational and practical possibilities. It requires so little ground space that every child ought to be able to find a place to plant his vine, where he can train it over a back porch, a fence or a blank wall.

a. How many of the children have grape vines of their own? How did they get them? Varieties? Age? Size? Yearly crop?

b. Methods of propagation? By layers? Cuttings? New varieties by seeds?

c. Best ways of transplanting a vine? Training? Feeding or fertilizing? Watering? Thinning blossoms? Summer and fall pruning?

d. Stories of grape vines? Origin of varieties? Exhibition of grapes grown by the school?

TAMING BIRDS ABOUT THE HOME

In the sweetest of all songs "Home Sweet Home" among the memories that cling to the wanderer's heart are those of the "Birds singing gaily that came at my call; Give me these and the peace of mind dearer than all." How many of us have these memories? Among our 20,000,000 homes, how many are there around which the birds sing blithely and come at the children's call? What kind of a country should we have; what kind of homes; what kind of children, if this were livingly true of all of them? It has long been a dream of mine, perhaps the dearest dream in my whole galaxy of dreams, to have this true of every home and of every child in our beloved country. Truly this relation to our bird life will add the liveliest charm and one which will cling most lovingly among childhood's home memories; and why not have every home possess this charm? A charm literally from the skies.

In seeking a universal motive which shall carry this relation to the heart of every child I find this deep, ancient motive of taming things, feeding and giving the cup of cold water. If it is only eating salt together, it brings a thrill, truly magical, of sympathy and life which can never leave the heart as cold as before.

How many of the children have birds tamed to come at call? Kinds of birds tamed? How was it accomplished? How many have bird fountains at their homes? How many provide food for their birds in winter and early spring? How many have put up bird houses? Provided nesting materials?

The end product of the course of nature study should be a living and abiding interest and love of nature. We can develop this only by active doing, by working out, year by year, the problems in our way. The function of the well-prepared teacher is to inspire the children and point out to them the problems that are most worth their while.

I have just written little Mabel Musser and asked: "If you could whisper in the ear of every boy and girl one sentence about your garden, what would it be?" She answers: "I feel nearer God's heart in my garden than any place else on earth."

CULTURAL SCHOOLS OR CONTINUATION SCHOOLS

By Anita U. M. Boggs, M. A.

As one thinks of the thousands and thousands of day laborers, factory workers and salesmen and women employed in the United States, and considers that these men and women are the parents of the future American race, one of necessity realizes that the work and the theory of the eugenists, of the social workers, of the educators, have as yet been but spasmodic attempts to touch the vital point of the full development of these people. The latest statistics on the subject show that only ten per cent of the millions of the school population ever attain the high school. Therefore ninety per cent at the age of fourteen, become in the eyes of the world mature men and women, expected to assume the burdens of maturity and to act in every respect as their more highly educated brethren. For as this vast army of children enters the operative class, the community and state as such cease to be interested in their cultural development.

The public conscience is however not quite torpid. With slow lethargic movement vocational training for children has begun to make some headway in child education. During the last twenty-five years, the haphazard manual training of the high schools has become crystalized into a clear-cut system of trade training penetrating the lowest grammar grade. The editor of the *Manual Training Magazine* (June, 1912), declares: " General ideas alone cannot from their very nature produce the specialist, except the specialist in generalities, and it is the specialist in specialties that causes the world to progress in the twentieth century." As one looks over the public school systems one sees how the idea is carried out. Boston, for example, has three pre-vocational school centers located in the elementary school districts. Any child over twelve years of age may enter and prepare himself at fourteen to attend the Boston Industrial Schools in which *specialties* are taught. Actual manual training begins in the Boston schools in the fourth grade. Opposition to vocational training for a long time came from a rather unsuspected source, the American Federation of Labor. Regarded as a potential wage cutter, the Federation of Labor frowned upon such training, but in October, 1909, at its meeting in Toronto, it withdrew its opposition and adopted a resolution in favor of trade schools for children between fourteen and sixteen years of age, *providing that other subjects be taught in addition to the industrial training.*

The importance of trade training is now acquiesced in by all educators; it is a potent factor in the bread winner's education. It is essential too that such training shall begin early enough in life to be available for those to whom school years are limited. The philosophy of education, however, forbids us to accept trade training with the few outside subjects which are taught, and rarely made use of as the true vocational training. In his inaugural address, at Princeton University, Dr. John S. Hibben says:[1] "The truly vocational study is that which fits one to respond intelligently and with full conviction to the *vocation* of man—that high calling which is the summons to no particular pursuit nor profession, but which is a worldwide and common call to every man to take his place, to do his work and to play his part in a community of his fellows. Whatever may be our special field of work, as men we are to live our lives within the great social organism of humanity. As Kant says, 'Man's greatest concern is to know how he shall properly fill his place in the universe and correctly understand what he must be in order to be a man.'" In short education should fit every child as it grows into maturity to accomplish something more than mere existence. The ideal towards which education must strive is the complete individual. The factory worker whose mental vision is bounded by his factory, his home and his community; whose lack of knowledge of what is going on in his own time is as great as his ignorance of the deeds of Caesar, is he a complete individual? The salesman behind his counter can probably recite the standing of the baseball clubs or give the social standing of his customers and all the bits of gossip about them, but if asked who is the present king of England or what are the terms of the Hays-Pauncefort treaty in regard to the Panama canal, will endeavor to turn the question by declaring such things do not interest him.

What is the cause of this ignorance, this lack of interest in all those things which go to make history, those subjects which are vital even to the individual who is not interested? It is certainly not the lack of opportunity to read about them; for the daily newspaper circulates as freely among the employees as among the employers. The cultured and the uncultured alike have access to the same source of information. Is this lack of development attributed to temperament? That would be an unfair attribution for temperamental preference exhibits itself only after it has had an opportunity to examine and select. The average working man or woman has lacked that opportunity. His education has been one-sided, uninteresting, he is but the logical product. At the age of six he enters the public school, is put in a class with thirty to fifty other children and is taught the elementary subjects in the most uninteresting fashion. The subjects have little or no connection with his life outside of school. Haphazard physical training is given; superficial physical examination, in which only the most patent defects or diseases are discoverable, is considered by the citizens of the state as sufficient to safeguard the lives of the children and to produce a race of physically better, healthier parents for the second generation. As the child advances in his school work the separation of school subjects and life becomes wider and wider. At the mature age of twelve he is introduced to manual training work; within the following year he must elect whether he shall study to become a mechanician, a bricklayer or a clerk. After his election has been made his whole attention is concentrated on learning his trade—outside subjects are frills to be gone through with hasty indifference. This indeed makes a man a specialist in his trade, he may know the composition of the material, its possibilities and limitations; he may be a fairly successful economic unit, but as a complete individual, he is a failure. The number of men who rise is pitifully small compared with those who stagnate at a dead level or degenerate. The fault lies not with the men themselves, but on the side of inadequate irrational education.

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[1] "The Philosophy of Education," *North American Review,* June, 1912, pp. 846-857, Vol. 195, No. 6.

Germany was the first, as usual, to notice this lack among her working population, and after a thorough study of the problem devised the system of cultural schools, sometimes called continuation schools (Kaufmännische Fortbildungsschulen). The cultural school is a continuation for at least two school terms of cultural studies by every apprentice in commerce or industry. Attendance at such a school for a certain number of hours a week is compulsory on the part of the apprentice: the employer on the other hand is required by law to permit his apprentices to attend the schools which are held for a certain number of hours during each day, and to pay said apprentices for the time consumed in such school work. In 1885 Prussia subsidized her cultural schools to the extent of one-half million marks, the schools numbered 664 with 5,800 pupils. In 1908 the subsidy was three million marks for 2,100 schools with 360,800 pupils. The majority of German states now subsidize such schools if they are held before seven o'clock in the evening. Würtemberg in 1906 passed a law organizing cultural schools, Bavaria prepared a similar law. In the latter instance the Sunday schools were transformed from two hours of instruction to cultural schools of six hours' instruction. About the same time Leipzig followed suit. Then the movement spread to Scotland. During the year 1909-10 Hamburg established a Bureau of Cultural Schools which teach the theoretical side of practical subjects; the emphasis, however, is placed on cultural subjects. The Hamburg statistics for the year 1909-10 show the numerical result at least of these schools.

Hamburg Cultural Schools 1909-10 (Kaufmännische Fortbildungsschulen):

Men	Summer	Winter
Workingmen (Handelsbeflissene)	2,492	2,838
Clerks, teachers, etc. (Beamte, Lehrer. u. s. w)	202	249
School children (Schulknaben)	479	472
Miscellaneous (Unbestimmte)	55	51
Total	3,228	3,610

	Summer	Winter
Women workers (Weibliche Handelsbeflissene)	1,050	957

Total men and women for Summer and Winter:

	Summer	Winter
Men	3,228	3,610
Women	1,053	957
Total	4,281	4,567

The population of Hamburg is about three-quarters of a million. To all probability the cultural schools have increased in a ratio proportional to their impetus at inception.

There are no cultural schools in the German sense in the United States. Every large city has its night schools of which the working classes may avail themselves if they desire; there are classes for general education conducted by the settlement houses; free lectures on city and philanthropic foundations are held during the winter. Few of these, however, are more than moderately successful. Optional attendance has its in-variable concomitant result—few go regularly. Some of the large department stores require their employees to have a certain amount of education. If a boy or girl coming into the store is not up to its requirements, he must spend so much of the store's time each day in the schools conducted by the store.

The John Wanamaker system of training is an admirable example of department store schools. In 1896 under the direction of Colonel William R. Scott, the "John Wanamaker Commercial Institute" was organized. All employees under eighteen are required to attend. At seven-thirty each morning every "cadet" is expected to report to his divisional teacher for assignment to the physical training department, to study! or vocal culture or to the instruction in the use of musical instruments. Systematic military training is given each boy and girl six mornings a week in thirty minute periods. Besides the drills, the boys are trained in regular gymnasium work in a gymnasium admirably equipped with the latest gymnastic appliances. The girls receive the same type of instruction omitting the very heavy work however. A physical examination is made of each cadet as he enters and records of his condition and improvements are always on file. Removable physical defects are attended to by the store corps of physicians, dentists, etc. For short the physical welfare of the employees, both old and young is adequately cared for with no expense to them. The aesthetic side of the children is developed by the means of the choral societies, by the *Military Band and Drum and Bugle Corps,* one for girls and one for boys, by the *John Wanamaker Commercial Institute Orchestra,* for the more advanced of the musicians, by the Dramatic Club, etc.

The Commercial Institute, however, lays the greatest stress on the educational side. Every boy and girl must attend the classes, must attain an average grade and must complete the course within a reasonable period. The subjects required are mathematics, spelling, penmanship, correspondence, business form, English, United States history, bookkeeping, commercial geography, commercial law, banking, public speaking, ethics, stenography, typewriting and French. These classes last from seven-thirty to ten each weekday morning. Besides these classes for the younger employees, the older men and women have a *University Course.* Each department forms a class and the head of that department is usually the teacher. Certain subjects are chosen for investigation and private research takes the place of lectures. Colonel W. R. Scott, when asked of the efficiency of these schools said, "We find our honest salesmen and saleswomen those who have grown up with us, who have gone through our commercial schools. They are eager for knowledge and seem to thoroughly enjoy their researches. It is a significant fact that the majority of the heads of our departments are graduates of our Commercial School. The training, mental, physical, aesthetic and ethical makes a better man and from a selfish viewpoint, a better clerk."

The working class of the United States in their peculiarly powerful position should be the best informed, most keenly interested people in the world. Every individual ought to know the affairs of the world as they change day by day; he should be taught to consider an industrial development in Argentina of the same importance as the discovery of potash in the United States or the building of a new factory in his own neighborhood. To assimilate, to digest and to draw intelligent conclusions from his facts, will change a narrow minded, bigoted, self-satisfied nonentity into a forceful, positive factor who in the long run will carry the standards of progress far in advance of the most highly specialized specialist. The social settlements are trying to uplift the poor, to inspire them with noble ideals. Their work on the whole, through no fault of theirs is as a man alone in mid-ocean who sinks because he does not know how to swim. The poor will forever be poor, the clerk will remain a clerk until they are taught to think intelligently, to react as the complete man to the community environment.

Commercialism in its most virulent form has penetrated the very roots of our society. Our children desire to study those subjects only which increase their economic efficiency. The workers desire to spend their lives in moneymaking with amusement as their only recreation, the citizens feel no responsibility to pay extra taxes to support compulsory cultural schools, the employers begrudge or refuse the time during the day necessary for efficient work and attendant results. It is not necessary to have the apprentice systems to make such education compulsory. If the state can legislate for children of fourteen, it has also the power to control and to require their school attendance to the age of eighteen. Any intelligent employer can perceive the patent difference between the keen, alive, well-informed clerks and those whose only thought is to spend as much time as possible doing nothing or as little as possible for their salary. At the moment the United States is developing not men but machines. To fulfil one's duty as a citizen is of little importance, to be, as a father the example of culture, of uprightness, of morality to one's children is but an intermittent ideal; to live as a man is a lost art.

The people of the United States can not afford to be shortsighted. The nations of Europe are developing as nations, the people of the United States as individuals. National pride and race betterment demand that we not only follow the example of others in the full development of our people, but that we forge ahead and give every man the opportunity to learn to be a man.

THE BOY SCOUTS THE SALVATION OF THE VILLAGE BOY

By Henry S. Curtis, Ph. D.

During the last four years the order of the Boy Scouts has been organized in every country in the civilized world. There are at present probably, in the various patrols, more than three million scouts, a number equal to the standing army of Russia. In this country the order is less than three years old, yet there are already three hundred thousand scouts and a whole library of books devoted to scouting. Perhaps at no time before in the history of the world has a social movement taken so strong a hold on the public imagination. Whenever an idea spreads as this one has done, it must come as the satisfaction of a long felt want. There is no explanation, unless there is some intimate relationship between its ideals and the natural ideals of adolescent boys.

The honor of founding the order belongs to General Baden Powell, the hero of Mafeking. He discovered that in times of peace, army life was very uninteresting to the men, and there were constant desertions. He sought to make it more interesting and hit upon scouting as the means. He had thought of it as a purely military expedient, but on his return from the war he was surprised to find that the manual that he had drawn up for his men had been adopted by several private schools in England. This led him to think that it might be really well fitted for boys anywhere, and he was led to revise and enlarge his manual. In doing this he got many suggestions from the Society of the Sons of Daniel Boone, which had been founded by Dan Beard several years before, and from the Woodcraft Indians, which had been organized with similar purposes by Thompson Seton. The bands of the Woodcraft Indians already numbered one hundred thousand boys, and Seton was conducting a training class in New York for the leaders of these bands.

On the Organization of the Boy Scouts of America, the Sons of Daniel Boone and the Woodcraft Indians came in as a part of the new order; and Powell says that we have here in America the strongest organization of the Boy Scouts there is. The Scouts are often criticised as a military organization, but the founder always insists that the work is to be peace scouting and must not be military in any sense. He says the boys will sicken of the military drill, and, while tactics are probably the easiest thing to give them, the boys will soon give up the practice. In this country we really have the Sons of Daniel Boone, the Woodcraft Indians, and the Boys' Department of the Y. M. C. A., inside the dress of Powell's Scouts. Outside the uniform and the patrol organization and name and an occasional drill, which is not encouraged, the Boy Scouts of America have nothing military about them. The order is trying to develop the sturdy virtues of the pioneer, and the love of outdoor life rather than soldierly virtues or vices.

The manual is the sort of a book that ought to be in every adolescent boy's hands. It covers essentially the virtues and accomplishments that are fundamental to youth. The scout must be familiar with nature, he should recognise all the birds, animals, fish, and flowers. He should be able to follow a trail, and to find his way in the wilderness, to camp out, and cook his own food. He should acquire the arts of the pioneer and the Indian. He is to avoid the wretched butchery of game, that so often characterizes the city hunter; for "the scout does not kill animals or birds except for food." He must practice the self-reliance and hardihood of the wilderness. These are virtues that appeal to every boy. They are the best possible antidotes for the idleness and coddling of so many fond homes.

The Boys' Y. M. C. A. has added to the scouts the idea of chivalry which has two fundamental concepts, those of honor and courtesy to women and the weak and aged. These are essentially adolescent virtues, most easily taught at this age. They add a sense of romance and dignity to the order. They also are essentially manly virtues of a crude but vigorous age. Some of us realize to our sorrow that a tradesman's word is not always as good as his bond, that an assurance that a thing will be done falls short of a guarantee, and the business world should welcome any sort of an order that would create and promote this sense of honor. Young America has as a rule much of the outer show of gallantry toward women, but this does not always represent that respect, almost veneration, that chivalry was supposed to stand for. At its best, chivalry is probably the best safeguard we have against the social evil.

Health and Athletics

There are two chapters in the Manual that come from the modern movement for health and athletics. These are excellent practical hints in caring for the health, and the games are a good series of outdoor games, such as any company of boys would play with pleasure. These are for the most part real scout games, which involve skill in woodcraft and scoutcraft.

First Aid and Life Saving

Scouting promotes the heroic virtues, and offers bronze, silver, and gold medals for deeds of heroism. Nothing could be more salutary than this promotion of courage. It invites the boy to run into danger, but only that he may rescue another. The order gives him its hero medal when he does it. Baden Powell tells a story of a boy who saw a runaway team in the suburbs of London. He got into the wagon, climbed out on the wagon tongue and knocked the horses' heads together until he "knocked some sense into them." He was given a medal for his bravery, and there followed a regular epidemic of stopping runaway horses among the boys. Recently I saw a horse running away down a crowded street. There was an eight or nine-year-old boy in the carriage. The street contained a goodly number of automobiles and carriages, and its usual quota of people on foot; but even the autos scurried to the gutter and not a person lifted his hand. We evidently need some of this scout training. There have been a number of cases where scouts have saved drowning people and not a few rescues from fire. The first aid is more or less necessary to scouts, because their scouting often leads them about the wilderness, where they are by themselves. Injuries are likely to occur, and they will be helpless if they cannot render this assistance themselves.

Patriotism

The scouts seek to inculcate patriotism through teaching respect for the flag, and the history of the United States. The scout pledges himself "to do his duty to God and his country."

The Scout Patrol

Scouts are organized into patrols of eight boys. Each patrol has a leader and an assistant leader. The leader at least is generally an older boy. Three or more patrols constitute a troop, and a troop is in charge of a scout master, who must be an adult. Boys from twelve to eighteen years of age may become members of a patrol. The scout wears a uniform of khaki, and carries on his hikes a billey that resembles a knapsack.

THE SCOUT OATH AND ORDERS

On becoming a scout the boy takes the following oath:

"On my honor I will do my best:

1. To do my duty to God and my country, and to obey the scout law;
2. To help other people at all times;
3. To keep myself physically strong, mentally awake, and morally straight."

The scout law may be summed up as the ten commandments with several social virtues added.

There are three common orders of scouts. The first degree is that of a tenderfoot, who must be able to pass the following requirements:

1. Know the scout law, sign, salute, and significance of the badge.
2. Know the composition and history of the national flag and the customary forms of respect due to it.
3. Tie four out of the following knots: square reef, sheet-bend, bowline, fisherman's, sheepshank, halter, clove hitch, timber hitch, or two half hitches.

In order to advance from this lowest order to become a second class scout, he must gain proficiency in a number of outdoor arts and he must have earned and deposited at least one dollar. In order to become a first class scout he must be proficient in general in the arts of woodcraft and campcraft, know first aid, have at least two dollars in the savings bank, and enlist a boy who has been trained by himself as a tenderfoot. After a boy has become a first class scout he may go on to become a life scout, a star scout and an eagle scout by acquiring proficiency in a number of arts and industries, such as agriculture, blacksmithing, athletics, swimming, surveying, etc. For each of these he must take an examination, and will receive a merit badge if he passes. The life scout must get five of these badges, the star scout ten, and the eagle scout twenty-one. In acquiring these merit badges it is not considered that the boy is really learning a trade, but he is learning to be handy along the lines of certain trades. He is getting the groundwork on which technical skill can be later built. It is almost necessary that the first steps be taken early if the boy is ever to be a master workman, and this training is a much needed supplement to the work that the schools are giving.

Popularity of the Boy Scouts

Why have the Boy Scouts had their marvelous popularity? I do not suppose that ever before in the history of the world has an order been organized in all civilized countries in so short a time as has the Boy Scouts. The order seems to be an almost complete proof of what is known in education and anthropology as the recapitulation theory, which is that "the individual repeats the history of the race." In other words the child is a primitive man, he climbs up to civilization by much the same stages, has much the same interests along the way, as had the race in its progress. The individual child is constantly conditioned in this progress by imitating the actions of a later period, by the advice and encouragement that is given him for different kinds of excellence. Yet still his deepest interests are the same as were those of the race at his stage of development. The boy enters at puberty upon a stage corresponding in a way to the period of tribal life. Its chief activities are, hunting, fishing, fighting. It is a wild, free life in an environment of nature. It is a time of courage sometimes of cruelty, of physical hardihood, of close observation and a simple strategy that is closely akin to the cunning of some of the higher animals. There are the fundamental interests of boys everywhere at this period of development. It is at this time that the boy first forms his gang, that he begins to play team games. He wants to hunt and fish, to camp out, and sit around the fire. His reading is mostly of tales of adventure. He admires above all other things independence and daring. These are essentially the virtues promoted by the Boy Scouts, although the order has aimed to substitute the interest of the naturalist for the love of the hunter and it has introduced a number of moral precepts which do not psychologically belong to the period.

I am inclined to think that the order is at present suppressing too much the military ideal. For the soldier is one of the natural ideals of the adolescent boy. It has to contribute the ideals of obedience, neatness and orderliness. It does not follow at all that the boy will be inclined to war when he grows up, because he has had military drill as a boy. In fact I am inclined to think it is likely to have exactly the opposite effect upon him. The soldier's duty is always more attractive in prospect than it is in realization. Baden Powell advises against frequent military drills, because he says that "it always makes the boys sick of it." If a boy has had his military craving satisfied in this way in his boyhood he will not carry over an unsatisfied craving to later years where it may cause trouble. The Boy Scouts are now organized in every country of the civilized world. In the near future we may look for international encampments and meetings. It is this knitting together of peoples across national boundaries, the meeting in conferences and conventions that is one of the greatest safeguards against war, and I am inclined to think that the chances of a world peace are improved rather than lessened through the organizatoin of the scouts.

As the scout virtues are essentially adolescent virtues, I cannot but wonder if twelve is not a year or two too young for a boy to be a scout. The ideals of the order seem to represent a period that usually begins about two years later, and while the little boy wants to imitate the big boy, it is not always a good thing to let him do it. Precocity is apt to lead to the feeble development of function. I do not think that the boy who takes it up at twelve will ever find it quite as interesting as he would if he waited until a year or two later. The older boys of sixteen or seventeen do not wish to associate with these boys of twelve and it will almost surely detract from the good fellowship of the camp, which is one of its essential virtues. If a boy becomes a scout at fourteen and remains a member of the troop until he is eighteen, he is a scout for four years, which is long enough.

If scouting represents and teaches the virtues of the chivalric age of adolescence is it not a training which every boy should have? I believe it is. It is a more fundamental training in manliness, virtue, self-reliance and efficiency than the boy is getting out of the school. It is certainly one of the best safeguards against the peculiar temptations and vices of puberty. It develops the good fellowship, for which there is at that time such a craving, and which is apt to ripen into the friendships of a lifetime. Friendship creates most of the joy and ultimate values of life, but we are thus far doing almost nothing to create it. Here we are met with an obstacle which seems to be almost insuperable. Very few men have the necessary training for scout masters, or the time or the inclination to render this important service. It is difficult to get the people to take courses of training to prepare them to render a service that will not be compensated. Hence I am inclined to believe that the order can never come to its own, until it becomes public and is required of all boys as a part of their school work. It is already required in a number of private schools and, I understand, in all the public schools of Russia, where its military side will doubtless be emphasized. Why not dismiss the upper grades at noon on Friday and let the older girls have their camp fire and the boys have scouting? This could not well be worked in the one-room rural school, and it would require nearly as many men teachers as women teachers in order to carry it out. But there are many new subjects, especially the industrial ones, and games and athletics that are also demanding more men teachers. Friday afternoon does not usually amount to much for school work. Its present value is not comparable to the value that might come from the scouts and the camp fire girls. This would apply especially to the high school age, and the high school is probably the place to try the experiment.

A number of things that scouting is teaching are the most fundamental things to the welfare of the country, the love of nature and the open air life, self-reliance, observation, co-operation, good fellowship. These are what the country needs. The rural community might very nearly or quite afford to exchange the education of the rural school for such a training. However under existing circumstances a satisfactory organization of the scouts is practically impossible in the open country, because there are no scout masters available, because the boys of fourteen and over are too widely scattered about the community to get together easily, and because thus far the country has not found the time for the boys to have the meetings. Again some social center is almost absolutely necessary if the scouts are to be organized in the country at present unless they can be organized through the county Y. M. C. A. or through the Sunday School classes, because there is no place otherwise where boys who have finished the elementary school can meet together to affect an organization. As there are very few counties having the county Y. M. C. A., regular Sunday school classes for boys with competent leaders, or social centers, it is safe to say that at present any satisfactory organization of the boy scouts is well nigh impossible in the open country.

Boy Scouts for the Village

It has been said, " God made the country, man made the town, but the Devil made the little country village." The country or suburban village is the most attractive place of residence in many ways that there is. The garden village seems to be the ideal toward which our housing and town planning movements are tending. In the village one may have a house to himself. He may have a yard and a garden, and room and safety for the play of the little children. If he wishes to walk or drive, it is only a short distance to the open country. But for the children from about ten years of age to eighteen, the country village is probably the most dangerous place morally there is. The children in the cities have their playgrounds and their clubs, libraries, museums, stores and other places where they may go and find instruction and pleasure. The children on the farm have their duties which keep them busy and teach them the trade of farming; but the village boy and girl miss both of these sources of education, the varied life of the city, which makes it a constant exposition of the arts and ways of civilization and the training of work which comes to the boy on the farm. There is no other place where there is quite so much idleness among the children as there is in the rural village, and idleness is always dangerous. It is in periods of idleness that children learn to smoke cigarettes, to shoot craps, to tell the smutty stories, to hear the smutty stories, to plan most of the things that their parents do not wish them to do. A boy may play baseball with eight other boys all of whom belong in the reform school, and so long as he plays he will not suffer much harm, but let him loaf around with these boys for a half hour and there is no telling how much harm may be done. A girl may play basket ball with four loose girls and be a perfectly good virtuous girl through it all, but let her sit down and gossip with these girls for a half hour, and a whole life may not be sufficient to undo the harm.

The village is probably the best place that there is for the organization of the Boy Scouts and it is also the place that needs them the most. The Boy Scouts is an outdoor order that is teaching the arts and crafts and the virtues and the independence of the wilderness. It is difficult to do these things in the city. Very little of woodcraft or scoutcraft can be practiced there. The order cannot well be organized in the country on account of the amount of work and the lack of leadership, but all the conditions seem to be favorable to the organization in the village. The surrounding country is available for hikes. There are usually woods and lakes in the neighborhood for scouting and camping. There is an abundance of time, and there is usually in the village some young lawyer or doctor or clergyman not overburdened with duties who can take charge of the troop. I believe the Boy Scouts and the Camp Fire Girls are the solution of the child problem in the village for the older boys and girls, and with this organization, the village will become the most attractive place in the world for anybody to live.

REDUCING RETARDATION

By FREEMAN E. LURTON, Superintendent of Schools, Anoka, Minn.

It is unwise, wasteful, and largely unnecessary for children in the grades to be retarded, that is, to be too old for the grades they are in, and therefore less likely than others to complete the work of the grades, to say nothing of attempting the work of the high school. Since retarded children receive less education, in thoroughness and extent, than others, and acquire the *habit of failing,* they are ill prepared for competing with the more fortunate ones in the affairs of life, and the handicap incurred in school is likely to impede them to the end. Therefore it is highly essential that careful consideration be given the matter of retardation.

Two kinds of retardation are recognized: Mental and administrative. In the former the child is wanting in normal mental capacity and is properly a subject for special schools and special treatment. He should be dealt with primarily by a psychologist. There are comparatively few of such and they do not concern us at the moment. Those *administratively* retarded are of normal mentality but for some reason have fallen behind the school schedule laid down by the school authorities. The major part of the retardation present in the public schools is purely administrative and accordingly susceptible of remedy at the hands of school superintendents; hence the situation has its encouragements.

Years of experience seem to teach that there is less difference than is commonly supposed in the actual mentality of children. Habits of industry or idleness, home-staying or street-running, attention or inattention, plenty of or too little sleep, regular or irregular school attendance, sufficient or inadequate nutrition, and similar matters of training or environment rather than difference in mental endowment, determine largely whether children do well or not in their school work.

A school system is efficient about in proportion to the number of its pupils who do the required work in the scheduled time, assuming always of course that a constant and reasonable standard of thoroughness is maintained.

Three years ago, on taking charge of the schools here, the writer concluded, after a preliminary survey of the situation, that there existed too large an amount of retardation, and at once attacked the problem. By various means the desired end was approached. The attention of the teachers was called to the condition and their sympathetic interest enlisted in a systematic effort to reduce the amount of existing retardation.

They were convinced that there was a direct and controlable relation between retardation and irregular attendance, tardiness, technicalities in setting and marking examinations, neglecting to coach up the slow pupils and those who have lost time from school, care or carelessness in assigning lessons, and similar matters that lessen the pupil's grasp upon his work. The exercise of greater care and sympathy, and in general a greater concern for the individual than for the "room" has produced some cumulative and valuable results in more ways than are indicated by the tables that follow, for such things transcend statistics and refuse to be tabulated.

The most serious thing is time lost from school. Pupils cannot often absent themselves from school and still "make grade." On the other hand very few pupils who attend regularly fail to be promoted at the year's close.

The first table gives the average number of days attended by each enrolled pupil annually out of the 180 that constitute the school year.

TABLE I—AVERAGE YEARLY ATTENDANCE, IN DAYS.

Year.	Number Days.	Gain in Days.	Gain in Per cent.
1909-1910	147		
1910-1911	154	7	4.7
1911-1912	159	5	3.2

Gain of 1912 over 1910, 12 days per child or 8.2 per cent.

This increase in attendance was brought about by showing the pupils what the loss of time meant to them, by requiring written excuses for absence and accepting none that were trivial, by compelling pupils to make up lost work and lost time if excuses were not accepted, by writing to or calling upon parents of irregular pupils, and by giving to each one who was absolutely perfect in attendance a certificate vouching for the fact, duly signed by the officers of the Board, the teacher, and the superintendent. These certificates are eagerly sought for and have proved a strong incentive to good attendance. Their results are shown in Table II and were a large factor in the results shown in Table I.

TABLE II—CERTIFICATES OF PERFECT ATTENDANCE.

Year.	Number.	Gain Per cent.
1909-1910	22	
1911-1912	61	177.2

As one would expect, a gain of twelve days per year for each child and a gain of 177.2 per cent in the number perfect in attendance would lead to a larger number of promotions each year. And it did. See next table.

TABLE III—PROGRESS RECORD.

Year.	Per cent Promoted.	Gain Per cent.
1910-1911	79.6	
1911-1912	87.3	7.7

This agrees quite closely with the gain in attendance.

Now, for final consideration, it is interesting to note how the number of retarded pupils has decreased, year by year, under these efforts.

TABLE IV—DECREASE IN RETARDED PUPILS.

Year..	Per cent Retarded.	Per cent Decrease.
1909-1910	70.0	
1910-1911	65.8	4.2
1911-1912	62.1	3.7
1912-1913	55.3	6.8

A total reduction of 14.7 in three years.

An investigation conducted in 1910 and covering practically the entire State of Minnesota showed the percentage of retarded pupils to be 59.3, so that now this place instead of being one of the worst towns in respect to retardation is now better than the average. There seems to be no good reason why the continued application of the above methods should not reduce the percentage of retarded children to a very small minimum, probably not over 10 per cent.

HEIGHT WEIGHT, VITAL CAPACITY AND RETARDATION

B. W. DeBusk, State Teachers College, Greeley, Colorado

The table published in this preliminary study sets forth the relation between the height, weight and vital capacity, and the grade distribution of the boys of the Colorado Teachers College Training School. The number, a hundred and five, is too small for satisfactory results, but the table is deemed worthy of publication because of what it suggests. The age is that of the last birthday. Gymnasium scales and stadiometer were used for height and weight. Corrections were not made for clothing. It is believed that this factor does not vary sufficiently to affect the general results. A wet spirometer was used to measure the vital capacity.

The groups studied were small. The retarded groups consisted of from one to eight boys. No attempt was made to isolate the various factors that contributed to the retardation.

Investigators do not agree in regard to the correlation between the different physical measurements and the school standing of the children. Porter for example, found that the precocious children of a given age were both taller and heavier than the mean; while the dull ones were lighter. The later study of Smedley was in agreement with these conclusions. Kline and Smedley found that the mean weight of boys in the truant school was less than that of boys in the public school, except at the age of ten. Gratsianoff and Sack, and MacDonald found a positive correlation between height and ability. On the other hand, Gilbert found no constant relation between height and weight and mental ability. He thought that the dull children were heavier than the bright between the ages of ten and fourteen. Porter and Smedley took the relation between grade and age as the expression of ability; while Gilbert took the teachers' estimate. Smedley found a positive correlation between school standing and vital capacity. Gilbert, on the other hand, found the correlation to be indifferent or negative, except that from ten to fifteen duller children have larger capacities.

The accompanying table gives the ages, grades, years of retardation and the mean measurements of the groups. The measurements of the first grade are not given. The greatest retardation is reached in the fourth grade and maintained through the course. The first accelerated children also appear in this grade.

As a rule, the retarded groups are both lighter and shorter than the accelerated or normal. The most positive correlation, however, is with vital capacity. Almost without exception, when compared with normal or accelerated children of their own age, the retarded show a vital capacity under the average, and also a greater variation from the norm than that of either height or weight.

Another line of investigation is suggested when we divide the vital capacity by the weight. This gives the average for each pound which tends to show the ease with which the oxygen supply of the blood and tissues is renewed, and should give a fair measure of the endurance and resistance.

It is not our plan to give more than an illustration at this time. Take the third grade for example: The eight-year-old children show an average of 24.4 c.c. per pound, the nine-year-old, retarded one year 23 c.c., the ten-year-old, retarded two years 20 c.c. The fourth grade gives the following: the accelerated 24.6 c.c., the normal 25 c.c., the retarded one year 24 c.c., retarded two years 19 c.c., retarded three years 22.7 c.c. At the ages thirteen, fourteen, and fifteen there is much less variation from the norm. This is probably due to the fact that fewer groups enter into the norm and that these are retarded; also that at these ages the children are taking part in the athletic activities of the school. The effect of such exercises on vital capacity is well known.

Those children who are in their proper grade positions for their ages show a constant relation of 25 or 26 c.c. per pound for all ages. Since height and weight vary least from the norm, it seems that the demands of growth must be satisfied first and that then the remaining energy can be turned to other work. This is suggested as a possible factor in accounting for much of the retardation.

Without isolating the different factors that contribute to the retardation, definite conclusions can not be drawn; yet the limited data presented suggests the following:

That the retarded children are as a group apt to be below the normal or accelerated in each of the measurements.

That the accelerated tend to stand above the norm.

That the accelerated and normal show a higher vital capacity per pound than the retarded.

That vital capacity varies most from the norm.

Out of the above has grown a number of related problems which are now under consideration, such as the verification of the above extended data, the correlation of these measurements with the position of the children as determined by the Binet tests; also the correlation with the results of tests for tuberculosis, with the presence of adenoids, with physiological age, and with such other factors as may seem to contribute to retardation.

BIBLIOGRAPHY

1. BURK, F. Growth of Children in Height and Weight. *Am. Jour. of Psy.*, 1898. Vol. 9, pp. 255-326.
2. GILBERT, J. A. Researches on the Mental and Physical Development of School Children. *Studies from the Psy. Lab. of Yale Univ.*, 1894. Vol. 2, pp. 40-100.
3. —— ——. Researches upon School Children and College Students. *Iowa Studies,* 1897. Vol. 1, pp. 1-39.
4. KLINE, L. W. Truancy as Related to the Migrating Instinct. *Ped. Sem.*, 1898. Vol. 5, pp. 381-420.
5. MACDONALD, A. Experimental Study of Children. *Report of the Commissioner of Education.* Washington, 1897-98. Vol. 1, pp. 985-1204.
6. PORTER, W. T. Growth of St. Louis Children. *Trans. of the Acad. of Science.* St. Louis, 1894. Vol. 6, p. 263.
7. SMEDLEY, F. W. Child Study in Chicago. *Report of the Commissioner of Education.* Washington, 1902. Vol. 1, pp. 1095-1115.
8. WEST, G. M. Observations of the Relation of Physical Development to Intellectual Ability made on the School Children at Toronto. *Science,* 1896. Vol. 4, pp. 156-159.
9. WHIPPLE, G. M. Manual of Mental and Physical Tests. Baltimore, 1910. 534 p. (Extended bibliography.)

	Age	7	8	9	10	11	12	13	14	15	16
Grade	No.	13	1								
	H.	3–11.7	4–1.5								
	W.	51.7	55								
	V. C.	1093c.c.	1500								
III	No.		5	2	2						
	H.		4–1.5	4–2.25	4–4.875						
	W.		60.6	68.5	70.5						
	V. C.		1481	1600	1450						
IV	No.		2	7	4	1	1				
	H.		4–4.125	4.5	4–5.87	4–6.5	4–9.25				
	W.		61	65.8	64.37	67	66				
	V. C.		1500	1714	1575	1300	1500				
V	No.			2	6	5	2	1			
	H.			4–4.75	4–6.54	4–6.25	4–8.125	5–3			
	W.			68	72.83	71.4	83.5	101			
	V. C.			1850	1950	1860	1900	2300			
VI	No.				3	5	5	2	1		
	H.				4–6.5	4–7.85	4–7.62	4–11.25	4–10.75		
	W.				70	77.7	74.2	80	89		
	V. C.				1660	2000	2020	2350	2200		
VII	No.					1	5	3	5	2	
	H.					4–8.25	4–5.9	4–11.8	4–8.25	5–4	
	W.					83	76.5	61.5	96.85	111.75	
	V. C.					2100	1980	1900	2400	2700	
VII	No.						2	4	1	8	4
	H.						5–0.18	5–1.75	5–4.625	5–5.56	5–5.68
	W.						81	101.75	105	117.57	128.82
	V. C.						2150	2550	2800	3112	3275
Norm.	H.	3–11.7	4–2.15	4–3.5	4–5.74	4–7	4–7.8	5–0.7	4–9.8	5–5.25	5–5.68
	W.	51.7	60	63.25	69.7	74.62	76.25	85.25	92.6	116.27	128.82
	V. C.	1093	1488.7	1718	1725.3	1891.6	1973.3	2290	2428.5	3029.6	3275

No., Number.
H., Height in feet and inches.
W., Weight in pounds.
V. C., Vital Capacity in cubic centimeters.
Proper grade positions for the age underlined.

THE FACT OF PERSONALITY IN THE DEVELOPMENT OF AN ATYPICAL CHILD

By Martha MacLear

Whatever personality may be, whether it is the sum total of all the qualities that go to make a person what he is or whether it is something else, the fact of personality cannot be denied. It is this fact which is the largest factor in developing the character and intellect of atypical children. This is what Montessori, following Seguin, means when she speaks of the spirit of the teacher calling to the spirit of the child. Psychologists call it suggestion, for we are what our companions expect us to be. With one, we are gay and witty, with another stupid and dull; with one, we are dogmatic and launch into lengthy discussions of a political nature, with another we are dreamy and artistic and talk of composition and the value of chiaroscuro. So with atypical children, with their uncomprehending companions they are stupid and dull; with their disappointed, arbitrary parents, they are sly and stubborn. But to a teacher who calls to their personality through the force of her personality, they respond eagerly and give the best of which they are capable.

Several years ago, I was asked to tutor a so-called defective child. She had been examined by a well known psychologist, and he was rather dubious as to whether any great improvement could be made in her mental condition. Her parents were well-to-do and had done everything they could think of to help her, but had never been able to find a teacher who could arouse her dormant mind. At last, they went to a celebrated school, the principal of which was interested in just such problems. By his advice the psychologist examined her mentally, and a doctor physically, and she was started on a new path. I was told to do anything that I pleased, the inference being that all concerned looked for results.

My task was made easier by the fact that from the first Lena took a liking to me. Fortunately, I had not red hair, which had been the cause of her disliking a former tutor. But I soon discovered that she (and I suspected her family) looked upon me as a social inferior because I worked for my living. In fact, Lena asked me naïvely one day, what I was before I was a teacher, had I been a lady! This sense of superiority counted for very much more with her than any sense of mental inferiority she might feel. Therefore, my first task was to make Lena, and likewise her family, feel my social importance.

There were various trivial ways in which this attitude showed. Lena would, in a rather condescending way, bestow upon me all her old, dirty erasers or bits of cast off paper. These I promptly refused to accept, and suggested that she throw her rubbish in the waste basket. Being of a generous nature, she liked to treat me, but was not allowed to spend more than ten cents for soda. Whenever she did this, I took her the next week to Huylers and spent fifteen or twenty cents on some fantastic drink. Although not given to braggadocio, I made it a point to speak casually of dining at the home of the principal of the school, or of calling on the wife of the learned psychologist, or of spending week ends on Long Island. The fact that I had been, for many years, in the school, and so knew every one from the janitor to the superintendent, aided me in giving Lena and her family the desired impression. When this was established, I had no further trouble with either Lena or her family. They were willing to do whatever I said. It is curious how simple-minded and impressionable New Yorkers are for all their boasted sophistication.

Lena was fourteen, rather tall for her age, with pretty dark hair and eyes. The only evidences of a dull mentality were a low forehead, and a dark, sullen look which came over her face at times. Also, she held her head down and had a furtive glance. It was never explained why she was mentally inferior. Perhaps there was some accident with her birth. The rest of the family, although not brilliant, were of average intelligence.

It had been decided that Lena should sit with the sixth grade, take sewing, cooking, art, and elementary science with the class, special gymnastics with a special teacher and the three Rs with me. She was a pathetic little figure, sitting in a corner of the room. The haunted, evasive look on her face showed that she felt that she was different from the other children. It was so apparent that she was misplaced that the next year she was put into the high school. There we followed the same scheme of work, placing her in classes where she could do the work, viz: domestic art and dometsic science, and placing her with a tutor for special work. This arrangement worked so well, and she derived so much pleasure and benefit from her intercourse with the other students, that she was advanced year by year with the class.

For years she had been told or else overheard, for her family were not careful about talking before her, that she was different from other children. Therefore, I endeavored always to impress upon her the fact that she was not unusual. Unfortunately, this is too true, for our schools are full of children who need special care just as much as Lena did.

One day she found a paper on the education of backward and defective children, and said, " That is what I am." Bearing this always in mind, I never corrected her or drew her attention to a short-coming, without prefacing the remark with the generalization that many people are so. For example, she was not observing, so picked up very little information. In drawing her attention to this fact, I said that many, many people in the world, never noticed what was going on around them and quoted several instances of such lack of observation. Then I gave Lena several problems to work out by observation, as, how does the motorman on the subway know when to start the train? Where are the electric cars made? It was astonishing the interest that she took in this work, and also, how she found in it a topic of conversation in her family, they being not much more observing than she.

One of Lena's difficulties was in telling or writing a connected story. She presented a perfect example of the psychologic term, total recall. If we went on an excursion, she could remember nothing. But when I began with the car we took, and proceeded step by step on the trip, all the incidents came back to her mind.

At the beginning of her course in domestic science, she found it impossible to write down the various steps she had taken in preparing her task. Her dislike for reading was extreme, perhaps because she found difficulty in following the connected narrative. When she entered the high school she was put into the brightest section of the first year English class.

This was done for two reasons, one, that she might hear and pick up bright remarks of others and, also, that she might realize that the liking for reading was not a peculiarity of adults but that children, too, delighted in books. How much of this she realized is a question, but one desired end she did attain. By the end of the year, she was able to write, in a clear, connected manner, what happened in the class room at a given time, and also, to put on paper, the proper receipts for her cooking processes.

I have spoken of the excursions that we took. One afternoon each week we went to some point of interest. For, true to a certain type of New Yorker, she was not familiar with much beyond the shops and the theatres. Another day, we went to the school ball games of various kinds. All this, with the purpose of giving the child something to talk about and so making her more like the other children.

Her swimming lessons were another source of attraction. At first, she was much afraid of the water, never venturing into it beyond her waist line. By the end of the second year of these lessons, the third of her life in the school, she was able to swim. This achievement marked an epoch in her career. It meant not only the conquering of the fear of the water but a control of her muscles, for she was very lacking in muscular co-ordination.

But what of the results in terms of exact knowledge? Our aim had never been to teach her anything. We had simply aimed to teach her to conceal her ignorance, for there are many good and useful members of society who can think no better than Lena.

However, I tried to teach her to read, and to do enough arithmetic to make change and to carry on the usual routine of the housekeeper. This she learned. Also, in talking to her, I tried to let her know what words meant and what signs stood for. One day she was reduced to tears because I said her mother was an animal. But my real aim was to make her like other people, so that she would have a chance to display the really worthy traits in her character. At first she was very self-willed and stubborn. When she found it impossible to have her own way, she resorted to cunning and even to lies. At times, a dark, sullen look came on her face like a black cloud. We did nothing for this directly, except in trying to manage so that she never reaped the fruits of her cunning. As she grew more normal and happy in her school life, these traits left her.

Her cooking and sewing were a great aid in helping her to gain self-respect. She cooked little dishes at home and sewed various things for gifts for the family. In this way, she received the praise and recognition so dear to all of us. And with a glowing sense of power in accomplishment, she lost the desire to lie, and, with the feeling that we all trusted her, she outgrew her stubborn attitude and the black look vanished from her face. Her expression became animated and bright, she gave vent to the sense of humor she was endowed with, and it was difficult to tell how she differed from other girls.

I do not wish in anyway to assume all the credit for the regeneration of Lena. The first acknowledgment should be made to the wise principal of that model school, who planned the whole campaign. Also to the psychologist and the doctor, who examined her and prescribed specific remedies; to the teachers of her various classes, who by their friendly attitude, helped toward the growth of self-respect, and to the great influence, although unconsciously exerted, of the many friendly children with whom Lena mingled. It is only from fear of giving pain to Lena and her family, that I hesitate to mention them by name.

My work was only part of many influences brought to bear on a backward child, and I record it simply with the hope that it may encourage others who are burdened in mind about so-called defective children. For Lena is not an unusual type, and much can be done along the same line, if only proper thought is taken, with any similar child, if she be placed under proper supervision.

SPARROW LANGUAGE (=JUNJUGHGEREN) THE SECRET LANGUAGE AMONG THE ARMENIAN CHILDREN

By Mesrob K. Jamgotchian

The secret, or the sparrow language (=junjughgeren)—as an Armenian child is accustomed to call it, is one of the interesting devices of the children in Armenia. Boys twelve to twenty-two years old use it; sometimes girls of the same age are familiar with it. I am personally acquainted with a girl of twenty-three in Worcester who speaks it as a mother tongue. The Armenian language lends itself readily to such devices. Every syllable includes a vowel and every vowel represents only one sound so that it is very easy to adapt to the alterations of a secret. The following examples will illustrate the method of alteration.

Where are you going? In secret language—"Who-jere a-jare you-jou go-jo-i-jing?"

I am going to school. I-ji a-jam go-jo-i-jing to-jo u-jus-choo-jool.

Come! let us go and play in the playground. Co-jome! le-jet u-jus go-jo a-jand pu-ju-la-jay i-jin the-je pu-ju-la-jay-gu-ju-ro-jo-u-jund.

From this illustration it is easy to see that it is not a new language, but the mother tongue disguised by a mysterious form and sounds. It is suggestive of the chirping of the sparrows from which it takes its name. The key of this secret is very easy to find. The skillful speaker separates immediately every word in the sentence into its component syllables and prefixes the j character to every vowel in the syllable whether the word is a monosyllable or a polysyllable.

It is my dog, becomes: i-jit (it) i-jis (is) mi-jie (my) do-jog (dog).

This is my teacher, becomes: thi-jis (this) i-jis (is) mi-jie (my) tea-jea-che-jer (teacher).

As is shown by these examples, when the word is a monosyllable and begins with a vowel, it is separated from its accompanying consonant and repeated alone and with the prefixed j accompanied by its following consonant, thus, it, is becomes i-jit, i-jis.

Diphthongs in a syllable are regulated in the following way. The consonant holds the first part of the sound while the introduced j carries on the whole sound of the diphthong as in tune, ti-june; misfortune, mi-jis-fo-jor-ti-june; dew, becomes di-jew.

When the boys of a gang suspect that either the members of their family or a stranger has become acquainted with the secret language, they are clever enough to divert attention by immediately substituting ch, gh, or z for j. In this way the language assumes a new character and practically becomes a new secret language, as in the following examples.

Did you suffer? No.

j. Di-jid you-jou su-ju-fe-jer? No.-jo.
ch. Di-chid you-chou su-chu-fe-cher? No cho.
gh. Di-ghid you-ghou su-ghu-fe-gher? No-gho.
z. Di-zid you-zou su-zu-fe-zer? No-zo.

The predatory life of the children inspires them to many activities. It is the group spirit which leads the members to suggestive discoveries and often ingenious devices for the sake of the group welfare. The use of long words and exaggerated sentences is characteristic of the child in the predatory group. Such a child satisfies his instinctive tendencies by the invention of the sparrow language. It would appear as if the interests and duties of the gang were more binding upon its individual members than those of the family. And such is really sometimes the case when a boy is heartily devoted to the exclusive activities of the gang and carries on a secret life with them. He spends most of his time away from the home circle and very often neglects his filial obligations. When he is questioned in regard to his behavior, he either lies, becomes obstinate, or bluffs or makes excuses in order to escape punishment, and at the same time to keep the secrets of his society. But the children of a group are clever and resourceful enough to provide more natural and intelligent means of keeping their secrets. Every environment dictates peculiar devices of its own.

A SWEDISH STUDY IN CHILDREN'S IDEALS

By Albert N. Gilbertson

A new study of children's ideals appears in the current issue of the *Svenskt Archiv för Pedagogik,* from the pen of Georg Brandell, of the University of Upsala. It is based on an investigation which the author of the article made in the common schools of Gothenburg in September, 1911. His conclusions are founded on returns from 889 children, 474 boys and 425 girls, ranging in age from eight to fifteen years. Throughout his study he makes comparisons between his own results and those of the similar studies in London by Earl Barnes, in Newcastle, Pennsylvania, by W. G. Chambers, and in Göttingen, Germany, by H. H. Goddard. He expresses his indebtedness also to the writings of G. Stanley Hall, John Dewey, Irving King, Alfred Binet and William Stern.

In the investigation the following question was given to the children: "What person (man or woman) whom you have seen, about whom you have heard spoken, or about whom you have read, would you most like to resemble? Why?" The questions were printed on slips of paper and were distributed among the children. The teachers in whose classes the inquiry was made were furnished with strict instructions concerning the conduct of the investigation. I shall here present the most important conclusions of the author.

Of the younger children the great majority chose persons in their own surroundings, but these ideals were rapidly displaced by characters more remote in time and space. Girls chose local ideals to a greater extent than did the boys at all the various ages covered by the study, the percentages being 35.3 and 28.2 respectively. About the tenth year a rapid development takes place in the transition from acquaintances to other ideals.

Parents were chosen most frequently by children of both sexes at the age of nine, receiving the votes of 40 per cent. of those of that age. From that time their popularity steadily decreases. The father is chosen most frequently by the boys, the mother by the girls. Relatives other than the parents are chosen most frequently at the age of eight, other acquaintances are most popular at nine. The teachers are not popular as ideals among the children. They enjoy their greatest popularity with children of ten and eleven years. Chambers expressed his surprise that children to such a small extent choose their teachers as ideals. "One would expect that teachers, coming in constant and close contact with their pupils for a number of years and specially engaged in the development of their minds and characters, would stand high in the series of ideals. For some reason this is not true." Of the American girls 4.5 per cent. name a teacher, while only 1.5 per cent. of the boys make such a choice. The Gothenburg children were somewhat more favorable to their teachers, 2.3 per cent. of the boys and 6.3 per cent. of the girls voting for their teacher. Not a single boy over the age of twelve chose his teacher. The author does not state what proportion of the teachers in the classes studied are men, but in Scandinavia men still form a large proportion of the teachers in the elementary schools.

The Swedish children choose historical and public personages to a greater extent than do the English and German. In this respect they are more like the American children. The percentage of the total number voting for persons in this class is 61.6, 69 per cent. of the boys and 53.4 per cent. of the girls. The Swedish children are more tardy in their transition to historical and public ideals than are those of any of the other three nationalities. This transition occurs in the case of the Swedish children chiefly at the age of ten. Historical persons form the most popular class of ideals. Their popularity increases steadily with the increasing age of the children. The boys choose their ideals from history more frequently than do girls. The historical characters chosen are almost exclusively Swedish. The very few foreign persons chosen were nearly all chosen by boys, who are disposed to go further afield for their ideals. Luther is the only historic character chosen by members of both sexes, namely by 0.4 per cent. of the boys and 0.7 per cent. of the girls. Six-tenths per cent. of the boys chose Caesar, 0.4 per cent. Columbus and Alexander the Great. Five-tenths per cent. of the girls chose Melanchthon. One of the Gothenburg boys chose Washington as his ideal. This boy, who was eleven years of age, seems to have lived in America as he wrote his answer in English. It read as follows: "George Washington. I like him best because he speaks the truth, and he has won the English war."

Gustavus Adolphus, the Protestant hero of the Thirty Years' War, is the great national hero, receiving the votes of 22.4 per cent. of the boys and 11.1 per cent. of the girls. His position is comparable to that of Washington among American children. The latter received 34 per cent. of the votes of the boys and 24.5 per cent. of the girls in New Castle. Gustavus Vasa, the liberator of Sweden, the next in order of preference was chosen by 7.6 and 4.5 per cent. of the boys and girls respectively. Both of these kings are most admired by children at the age of eleven; their relative popularity gradually decreases in the later years. John Ericson, the Swedish-American inventor, of "Monitor" fame, is very popular with the boys, being the ideal of 5.7 per cent. of the latter. He received the greatest number of votes from boys of thirteen, namely, 14 per cent. of those of that age. He does not receive a single female vote. This may be due to the much greater interest in inventions among boys. The fourth most popular character is Charles XII, the famous warrior-king.

People in contemporary public life are chosen more frequently in the later years than in the earlier. Selma Lagerlöf, the Swedish authoress and Nobel prize winner, is the greatest favorite among girls (14.8 per cent.). She is not named by any child younger than ten years. Edison received 1 per cent. of the votes of the boys. Mark Twain and President Taft each received the compliment of one vote. Sven Hedin, the Swedish explorer, is the most popular contemporary character with the boys (3.6 per cent.).

Kings and statesmen are more popular with boys than with girls. The latter show greater admiration than do boys for people distinguished in the arts of peace, who have not been kings. The votes for rulers are more than twice as numerous among the boys as among the girls (38.6 and 17.4 per cent. respectively). Twenty-six and eight-tenths per cent. of the boys and 34.8 per cent. of the girls voted for persons in exclusively peaceful pursuits. Warriors, who have not been kings, were not the choice of many of either sex, though they were chosen to a somewhat greater extent by boys than by girls. Rulers are most popular with children of eleven. Girls esteem, more than do boys, authors and artists. Even men of science are more popular with girls than with boys.

Characters from fiction are named to only a very small extent by the children, 3.2 per cent. of the total number. They occur three times as often with the boys as with the girls, 4.9 and 1.4 per cent. respectively. Americans will be interested to find that the author has placed our own Buffalo Bill under this head. He leads the list of favorites of this class. Col. Cody will be surprised to learn that he is a fictitious character. His nearest competitor is Robinson Crusoe. Texas Jack comes third. The writer of this review must admit that he is not sufficiently familiar with American literature to know whether or not the last-named worthy is correctly classified.

Girls choose Biblical characters more than twice as often as do boys, 9.4 and 4.2 per cent. respectively. The percentage for the total number of children was 6 per cent. Two and two-tenths per cent. of the boys and 4.9 per cent. of the girls said they would like to be like God or Jesus. Chambers found that 2⅔ per cent. of each sex expressed such a desire. Other American investigations show a somewhat larger number; but none indicate a pronounced interest in characters with religious associations. In Scotland, England, and Germany a higher percentage was found. In Edinburgh 7 per cent. of the boys and 13 per cent. of the girls named God or Jesus. Of the London children, studied by Barnes, the corresponding figures were 7 per cent. for the boys and 14 per cent. for the girls, while 4 per cent., chiefly girls, chose Biblical characters other than the Godhead. In a New Jersey investigation, also by Barnes, 4 per cent. of each sex chose the Godhead, but no one named other Biblical characters. In Göttingen 5 per cent. of the boys and 8 per cent. of the girls named God or Jesus, while Biblical characters were chosen by 2 per cent. and 7 per cent. respectively. In the present Gothenburg study no boys older than ten years named Biblical characters, human or divine; no girls older than thirteen. The curves for both sexes go downward, but that for the boys, which at first exceeds that for the girls, sinks much more rapidly.

Girls choose men as ideals several times more frequently than do boys women. While only 7.4 per cent. of the boys have named women, 44.7 per cent. of the girls choose men, a ratio of approximately 1:6. Similar results were obtained in other investigations, especially in America. Miss Dodds, for example, found that 34 per cent. of the girls stated expressly that they would rather be men than women. In England and Germany, the tendency for girls to choose men was less pronounced. In this respect the Swedish children more nearly resemble the American. Among the boys the disposition to choose persons of the opposite sex decreases in the later years, not a single boy over twelve years naming a woman as his ideal. On the other hand, among the girls this tendency increases with age, being more than twice as great at fifteen as at eight. Outside of female acquaintances, the only woman named by boys of any age is Selma Lagerlöf.

Uniformity in the children's choices is greatest from ten to thirteen years. At both earlier and later ages greater variation is shown. As an explanation of this phenomenon the author says, "It would surely be too bold, on the basis of the available material, to attempt to present an hypothesis concerning the cause or causes of the variability in the uniformity. The increasing uniformity might possibly be conceived as depending on the levelling influence of the instruction, and the diminishing uniformity after the age of twelve on the gradually progressing individualization of the child, which at the above-named age may have advanced far enough to make itself felt side by side with the levelling forces of the instruction. The low degree of uniformity among children of eight and nine may thus depend on a certain planlessness in the choice of ideals, the decrease in uniformity after twelve, on the other hand, may be caused by the possible fact of the child's individuality now being sufficiently developed to exercise an influence on its choice. The leveling tendencies of the instruction may make itself most strongly felt between these two stages. It is clear, however, that the correctness of this interpretation may be strongly questioned. Further researches on this point are necessary."

Girls employ, more often than do boys, "the undifferentiated goodness" as motivation for their choice of ideals, 34.4 and 15.7 per cent. respectively. The disposition to use this kind of motivation decreases, however, with both sexes with increasing age, although it decreases somewhat slower with girls than with boys. The use of this so-called "undifferentiated goodness" has been interpreted as an indication of small development in the power of analysis; the different aspects of a personality are conceived as an indefinite whole. But the author does not regard this explanation and its application to the difference between boys and girls in this respect, as conclusive. The fact that clearly girls prize the goodness of people more than do boys, is a factor which has contributed to the difference of the sexes on this point. Not in all instances has mere goodness been given as the only motivation. In many cases, especially among the girls, one or more qualities have been named in addition to goodness in general, showing that the children may be able to differentiate, even when goodness is the chief cause of admiration. On the average about 11 per cent. of each sex uses this "undifferentiated goodness" as the *only* motivation.

Material considerations play a subordinate rôle in the choices of Swedish children. Less than one per cent. have motivated their choices with material advantages of one sort or another enjoyed by their ideals. This motivation is more frequent among boys than among girls. The English, Prussian, and American children valued material things much more highly than do the Swedish. In New Castle the percentage was 6, 7 for the boys and 5 for the girls. Our author comments on these figures as follows: "When we consider that these figures were obtained in investigations in the dollar-land, America, they must be regarded as extremely low." The English and Prussian investigations show larger figures. In London material advantages were named by 10 per cent. of the boys and 14 per cent. of the girls, and in Göttingen 14 per cent. and 5 per cent. respectively, came in this group.

Even social position, honor and fame are matters of small importance in the minds of Swedish children, 2 per cent. of the boys and one per cent. of the girls. A comparison with the results of other investigations are of great interest on this point. It shows that American and English children value "position, honor, greatness" to a much greater degree than do the Swedish. Of the last, only 2 per cent. of the boys and 1 per cent. of the girls come in this class. While in New Castle this motive appeared in 16 per cent. of the children, 18 per cent. of the boys and 13 per cent. of the girls. In London this was the motive of not less than 20 per cent. of the children. This type of motivation occurs to a greater extent among the boys than among the girls in all the different studies.

On the other hand, the Swedish children place intellectual and artistic qualities very high, higher than do English, Prussian, and American children. In Gothenburg 27 per cent. of the boys and 33.9 per cent. of the girls named these as their motivation. Only 3.5 per cent. of the boys and 6 per cent. of the girls in New Castle indicated this as the reason for their choice. In London this group comprised 6 per cent. of the children, in Göttingen 20 per cent. of each sex. All studies show that girls have greater appreciation of qualities and activities in this field than have boys. Other investigators have found that this appreciation develops with increasing age. The same is true of Swedish children in a very pronounced way, the percentages for the age of eight being 2.8 for boys and 4.4 for girls, for the age of fourteen 43.4 and 62 respectively.

References to physical characteristics, such as an attractive appearance, etc., occur very sparsely, and then mostly at the earlier ages. The percentages for the total number of children are 2 for the boys and 1.4 for the girls. For New Castle, the figures are 2 per cent. for the girls and 1 per cent. for the boys. Greater importance did these qualities have for the English children, namely, 4 per cent. of the total.

Moral qualities were named by 12.4 per cent. of the boys and 22 per cent. of the girls. In Chambers' investigation in New Castle 22 per cent. of the answers were put in this group, a relatively larger number than is the case in the Gothenburg investigation. Other investigators did not place these in a separate class. Closely akin to this type of motivation is that expressed by a desire to help others. Motivation of this kind is most frequent among girls, 4.1 per cent., to 0.9 per cent. among boys. In New Castle the corresponding figures were 5 per cent. and 2 per cent. The results of other investigations point in the same direction. Our author therefore concludes that altruistic tendencies are stronger in girls than in boys. The figures do not indicate a development of altruistic sentiments with age. On the contrary, there is a rather steady decline in the case of the girls. The figures for the boys are so small that no conclusion can be based on them; only at the ages of nine, eleven and thirteen are there any in this class. It has been believed that the altruistic tendencies decrease about the age of twelve or thirteen. The results of the Swedish investigation do not contradict this view. Indeed, the percentages, for girls, are less at twelve and thirteen than at eleven and again at fourteen. They are twice as high for eight and nine as for fourteen. More light, however, is shed on the problem by adding all the motivation in which moral qualities are mentioned, namely, those dealt with under "undifferentiated goodness," "moral qualities" (specific) and "desire to help others." These combined curves show the moral standpoint employed more often by girls than by boys at all ages. "Equally clear does it appear," says our author, "that these purely moral standpoints steadily lose their power over the minds, the older the children become. It does not seem, however, that this fact should give cause for any pessimistic conclusions, for the moral standpoints are clearly displaced by others, which might be placed almost as high, such as intellectual and artistic, social and political." The curves for both sexes show an increase after twelve years, when they are at their lowest point. This fact seems in some measure to confirm the theory referred to above.

Social and political qualities and activities are more esteemed by boys than by girls, 13.5 per cent. and 7.7 per cent. respectively, and this at all ages, except the first, when they are equal. These figures are higher than those which Chambers obtained in New Castle, 4 per cent. for the boys and 3 per cent. for the girls. For Swedish children these standpoints seem to play a greater rôle than for the American. The curves indicate that the social consciousness is in a state of progressive development during school age.

Boys have greater admiration for military qualities and achievements than do girls, 31.7 per cent, and 10.6 per cent, respectively. This admiration increases with both sexes until the age of eleven or twelve, when it begins to decline. In this group are included those answers which emphasize the devotion to the fatherland manifested by their military favorites. They depend, therefore, also on a social consciousness. Such could be considered as falling under social and political type. The Swedish figures are large, compared with the percentages Chambers obtained in New Castle, 18.5 and 2, for boys and girls respectively. The author adds this comment, "That the Swedish school boys to such a high degree admire military deeds and qualities, has its primary cause in inherent instincts. But these instincts are awakened and developed especially through the instruction in the history of Sweden, which to a large extent is a narrative of glorious victories, won by the Swedish arms."

Our author lastly calculates the number of points of view found in the answers. He finds that girls are richer in points of view than boys, a conclusion, he states, which he has arrived at also in other studies in child psychology. The superiority of the girls in this respect prevails at all ages. After twelve the curves for both sexes show a decided direction upward.

The author concludes his study with a consideration of the pedagogical significance of his results.

Referring to the fact that school children in the early grades choose their ideals from among people with whom they are personally acquainted, and later more and more choose from among people in contemporary public life and characters in history and fiction, "This is an expression of the growth of the personality together with a steadily progressing expansion of the circle of experience. That such a development is desirable, is beyond all doubt. If the children persistently chose their ideal from their immediate surroundings, it would indicate that their development was arrested, and that they possessed a direction of thought and volition answering to narrow provincial conditions and therefore would be without value for more highly developed culture. But," he goes on to say, "this is only one side of the matter. It is clear that this development should not take place with the greatest possible haste. It cannot be desirable that children should regard as ideals persons whom they are not in position to understand. The admiration they give them, thus comes to depend on the fact that they misunderstand them. It is certainly necessary to give the children personal ideals, but it should not take place before the children have reached the age in which they can conceive their real merits. Admiration for the great personalities must not be awakened in a mechanical way or exclusively by the aid of faith in authority. Such an admiration is external and artificial and leaves the child's volitional life untouched."

The author states as a general pedagogical principle, that "children at the earliest ages should look up to and have devotion for their parents, brothers and sisters, teachers, and others with whom they come in personal contact." This seems to be the presupposition for their being able really to raise up as ideals the greater personalities, whom they later meet in history and literature.

Speaking of the age when the transition should be made, the author states that we have not yet a pedagogical thermometer for the exact determination of this and most other problems of the science, depending as it does on so many factors of which we have as yet no definite knowledge. He refers to the fact that the studies in America showed that children of six, seven, and eight to a pronounced extent chose historical and public characters as ideals, must naturally be regarded as depending on the children's being led altogether too early into a world, which only at a later age they are in condition to understand." He questions whether even Swedish children do not make this transition too hastily, especially about the tenth year. Even children of ten years may find it difficult to get any high degree of understanding of historical and public characters, and "it can be assumed that their indicated choice is in many cases not an expression of a definite volitional direction."

In this connection the author presents four curves showing the frequency of choice, by the New Castle children, of Washington and Lincoln, and, by the Gothenburg children, of Gustavus Adolphus and Gustavus Vasa. We get two types of curves. One type is represented by the curves for Washington and the two Swedish kings, which are very much alike, the second type by the curve for Lincoln. The first three curves all reach their culmination at the age of eleven, after which they decline, the Lincoln curve, on the other hand, rises pretty steadily and reaches its highest point at the last age studied. Concerning the first type the author thinks it necessary o inquire whether its rapid rise and fall are not causally connected. Barnes and Chambers have considered this question in the case of Washington. Our Swedish investigator agrees with their conclusion that Washington is impressed upon the children at an age when they ought to seek their ideals in their immediate environment, for when "the sugar coating" is worn off through later reading and experience, children turn away from their former idol. The same he holds to be true of the two Swedish heroes. The Lincoln curve he considers an indication of the more normal, truly idealistic development.

CHILD STUDY IN BOHEMIA AND MORAVIA

In a recent book entitled "Studies of School Children," Dr. Frantisek Čáda, Professor of Philosophy and Education in the University of Prague, gives a sketch of the beginnings of child study in Bohemia. The first recognition of its importance is to be found in two articles published in the Bohemian Pedagogical Review, "Komensky," in 1882, "A letter from the First Standard," by Y. Funticek, and "How to Popularize the Science of Child Study," by Jos. Klika.

In 1884, L. Pivoda translated from the Polish "Recent Advance in Education." In his article Dr. Hall's investigation on "The Contents of Children's Minds on Entering School," made in the Boston schools, was described at length. In the same year, a schedule of seventy-one headings for the observation of pupils was published by Y. Funticek.

A still more important movement was inaugurated in 1894 by Jos. Pavelka, who translated the book of the Polish psychologist, Professor David, "A Program for the Psychological and Educational Observation of the Child." In the twenty-nine chapters of this book, the author sets forth the results of experimental investigations in North America and in European countries, while the last three chapters give a summary of pedagogical researches in Bohemia and Moravia. Since this year, 1894, many Bohemian colleges have initiated courses in Child Study. In Pilsen a special inquiry with a hundred and sixty-eight rubrics was carried out by the teachers Boh. Bennes and Al. Bilek. The pupils of the first standard were studied by the director Jos. Simek and teachers Wil. Küller and Jos. Groh. In the Training College in Kr. Hradec courses were given to the students in the bodily and mental development of the child. Child study was also established as a regular course in the Training College of Brünn.

The Bohemian pedagogical reviews have since that time published many observations on children. Among these was an inquiry in regard to the concepts of children in the third standard of the Bohemian schools.

The best child studies have been published in the Bohemian Pedagogical Review, "Pedagogické Rozhledy." This is a monthly having fourteen sections, each with its own editor, and has been published for twenty-six years. Among the child studies published in this periodical are:—

In 1888, "The Bodily and Mental Development of the Child," by E. Formánek; "Sex Differences," by J. Kapras; "Studies of Pupils in the Secondary Schools," by F. Havlik.

In 1891, "Play and the Mental Development of the Child," by J. Kapras.

In 1893, a review of the translation of Professor David's book, in which A. Svoboda called attention to the progress made in psychology through methods of investigating school children, and a proposition was made to establish stations for pedagogical research. He made a plea in this article for individual biographical records of children before school age. These records should be kept in the pedagogical archives of each school.

From 1888 to 1897 there have been published reports of the child studies made in other countries by K. Lange, G. Stanley Hall, S. Berthold, A. Rude and others.

In 1898 were published a review and epitome of Baldwin's "Mental Development in the Child and the Race" and reports on the pathology of children from French, Russian and German reviews.

In 1899 "The Necessity of Experimental Investigation for Ascertaining the Principles of School Hygiene," by Jos. Cerny.

In 1900, "Measurement of Mental Phenomena," by V. Krcek, and a translation of Sully's "Psychology of Childhood."

In 1901, "Hygiene of Attention," translated from the Russian.

In 1902, Preyer's "Mind of the Child," translated by J. Zeman, Perez' "The Child," translated by V. Cerny, Ebbinghaus's "Experimental Psychology," and James' "Psychology."

The systematic guidance of child study was established in this review, Pedagogické Rozhledy, by Professor Cáda in 1903. A study of children's drawings was undertaken under his direction. His energy and skill inspired many zealous workers and made this section the center of the review. Many original articles, reviews and notices of American, English, French, German, Italian and Russian books have been published in this section during the last ten years. Contributions by the editor himself are: "A Study of the Speech of Children," 1905-07, and "Pedagogical Studies of School Children," 1910-12. Other contributions are: "Pedagogical Investigations in the First Standard of the Elementary School in Krasna," by Mil. Silhan, 1908; "Environment of Children in the Elementary School in Doksany," by V. J. Rehák, 1907; "Study of the Valach Child," by V. Mrihlad, 1907; "The Investigation of School Children by Teachers," by Dr. T. Janek, 1908; "The Slovak Child," by F. Bobek, 1909; "The Child and Nature," by F. Hajn, 1909; "An Investigation of the Children in the First Standard of the Practice School in the Training College in Kr. Hradec," by V. Küller, 1908-10; "The Perception of Colors by School Children," by F. Kotoun, 1910; "A Contribution to the Perception of Colors by School Children," by L. Novotny, 1910; "Child Study Schedules in the Hands of the Teacher," by J. Veprek, 1910; "Children's Abilities," by Jos. Kubálek, 1911; "The Bohemian Child at Tesin (Silesia)," by F. Prazák, 1912. "Child Study in the Training Colleges," by J. Kubálek, 1910; "A Sketch of Child Study in the Training College at Brünn, by Jos. Sustal, 1910; "Children's Drawings in a Moravian Slovak School," by J. Hodek, 1912; "The Bodily and Mental Condition of the Child of Six," by J. Kubálek, 1912.

The following investigations were made in Bohemia: "Contents of Children's Minds," made on the basis of Dr. Hall's schedule, with 119 boys of the first standard. In Prague a study of 232 girls and 42 boys was made by Professor Cáda. The experience, knowledge, habits and behavior of his pupils, both at home and in school, were observed and recorded. The children had no knowledge that they were under investigation. Materials were obtained in the regular course of school work through compositions or through questions, and each child's record was preserved throughout the year. There were some two hundred headings used in the schedule.

In the year 1910, an association of child study was established in Prague. The educational committee of the city council of Prague voted a sum of one hundred dollars for the new institution.

In addition to the books and articles already mentioned, the following books were published in the Bohemian language:

G. S. Hall, Ph. D., "Selected Essays on Child Study," translated by J. Mauer.
Fr. Cáda, Ph. D., "Hyn's Psychology."
Ot. Kádner, Ph. D., "Contributions to Experimental Pedagogy."
Fr. Náprstek, "The Child and His World."
Rud. Neuhöfer, "Introduction to Child Study."
J. Sully, "Child Study," translated into Bohemian by Telcl.

EMANUEL LIPPERT.

REPORT OF THE BOHEMIAN NATIONAL COMMITTEE FOR PROTECTION OF CHILDREN

It is only within the last decade, that the care and protection of the child has attracted the attention of the Austrian public. There were already in existence many institutions for the care of children, but since the celebration of the fiftieth anniversary of the reign of the emperor Francis Josef I the public has begun to recognize the need of organization of that care and protection.

The movement for child protection in the kingdom of Bohemia resulted in an organization, created by the committee of the national parliament. The law of 1901 made a great improvement in public care for destitute and neglected orphans by giving the administrative surplus of the orphans' treasuries for the above mentioned purpose for ten years. In this way the nation obtains about 600,000 crowns (= 60,000 dollars) yearly and from this fund more than 5,000 orphans are cared for and educated. The children are placed either in families or in some institution. (There are about 100 private institutions for the protection or education of deficient children in Bohemia.) In each district there was established an orphans' council especially for inspecting the children located in families.

The first Austrian congress for protection of children, held in Vienna, (1907) showed clearly the need for more energetic protection of children in the empire, which in this respect was far behind England, France and Switzerland. Therefore a central Austrian council for protection of children was founded in Vienna and at the National School Council committees for protection of children were established. The Bohemian National Committee recognized that great numbers of the bodily and mentally defective, destitute, neglected and delinquent children were insufficiently cared for, because of lack of organization, to keep records of the children and coördinate the institutions already at work. The first president of the B. N. C. was Fr. Count Thun, LL. D. After a year he was appointed viceregent in Dalmatia and then Fr. Cáda, Ph. D., Professor of Philosophy of the University of Prague was elected to the presidency in acknowledgment of his great services in the work of the Committee.

In examining the results of the B. N. C. during the past 3 years one must acknowledge, that a remarkable piece of social work was performed: The organizing of the Committee for Protection of Children aroused a powerful movement in this direction so that in each district an association was founded, which ensured active coöperation between the public organizations for the protection of the child and private beneficence. Thus 82 district Committees for child protection were established. The B. N. C. is in constant communication with these Committees. The work is thus divided: The district committees undertake the care of the *poor* young people in their districts.

The B. N. C. in first rank cares for the children having any *special deficiency.* But in second rank the B. N. C. has already supplied for 3,000 children aid and care from persons or communities. Last year, a detailed scheme was elaborated, for the inspection of the children and examination of the requests for public help demanded for a child. A great part of the work of the B. N. C. was expended upon direct care of the children. In the year 1909 the B. N. C. cared for 69, in 1910 for 271 and in 1911 for 433 neglected, mentally or bodily deficient children. Children, who need special medical and pedagogical superintendence, are placed in a colony of the B. N. C. There are now seven such colonies (Uhrineveˇs with 20, Kamenice with 13, Lysá with 14, Cistá with 9, Jílové with 26, Klikovice with 10 children and Postupice with 2 rachitic children). Among the colonies and institutions are: 1. A colony for 8 epileptic children in Ustí nad Orlicí, 2.) a day refuge for 50 children whose parents are employed during the day in mines, and 3.) a refuge for inexperienced apprentices coming from villages in the capital of Prague. Already in the first 2 months 31 boys have been cared for and now all 50 places are continually occupied.

For deficient children the B. N. C. establishes much needed institutions. Up to the present time there have been founded: 1. House of education for 50 slightly mentally abnormal children (the first institution of this kind in Austria-Hungary) in Kr. Hardec; 2. a house of education for 50 destitute children (25 boys and 25 girls) in Jilemnice. The cost of the building was 70,000 crowns (7,000 dol.); 3. a hospital for incurable children or for children with many defects, who until now have vainly, sought a refuge. For this purpose a building costing 210,000 crowns was purchased.

In institutions of other beneficent associations the B. N. C. has 35 children.

The industrial section of the B. N. C. is also establishing club rooms for young people employed in trade. Other sections of the B. N. C. are: Legal section with a consulting room for giving advice according to the laws, a medical section for medical inspection of the children. This section also mediates placing of sick children in hospitals and provides courses for care of nurslings and babies. The pedagogical section has an active propaganda for modern pedagogical problems and inspects the education of the children under its wardship. The social political section has proposed schemes of needed laws and have assumed charge of increasing the number of general guardians. These have been appointed in nearly all the 82 districts.

A genuine reporter of the work of B. N. C. is the review "Ochrana mládere" (Protection of young people) published by an editorial council of 6 officers of the Committee. The balance sheet of the B. N. C. of the year 1911 shows 321,828 crowns of assets and 223,400 crowns of expenses. The collections arranged with permission of the School Board among the scholars of elementary and urban schools yielded 67,716.42 crowns (21 per cent. of all assets). The jubilee day of the emperor (2. December) is given each year as a holiday for festivals and entertainments of children and all gain from these entertainments is collected for the B. N. C. In the year 1910, among 1,077 members of N. B. C. 348 were teachers and 154 school officers (also 502 members = 47 per cent). This year there are 1,638 members. Of 28 officers of the association, 5 are teachers from elementary and urban schools.

As a specimen of the 82 district Committees for protection of children I quote the Committee of Zirkov. This has: 1. pedagogical.

2. managing, and 3. helping section. There have been established 2 colonies for 7 orphans in Radesovic and for 8 orphans in Rican. In December 1910 a refuge for 120 school children was opened in the eastern part of the town Zirkov. In the year 1910, 621, and in year 1911, 276 children received boots and garments. Many lectures were delivered for parents in regard to hygiene of babies and good and bad reading for children. The Committee also arranged many cinematograph representations for school children. Many members inspected the fatherless children cared for by the B. N. C. The general guardian defended the rights of these children (in 1910 there were 128, in 1911 180 such children). For the year 1912 and 1913, it is proposed to establish a crêche and a reading room for school children in the town Zirkov.

The balance sheet of the Committee is this year: assets 10,448 crowns and expenses 6,795 crowns. Among 324 members there are 120 teachers (37 per cent), although the teachers form only 0.2 per cent of the town inhabitants. Among 29 officers are 7 teachers.

EMANUEL LIPPERT.

BOOK NOTES

The Rhodes Scholarship, by GEORGE R. PARLSIN. Boston, Houghton, Mifflin Co.,1912. Pp. X + 250.

The subject of the Rhodes Scholarships has at last received its due meed from the man, or rather the two men, who are uniquely equipped for such a task—Dr. Parlsin, the Secretary to the Rhodes Trustees, and Mr. F. J. Wylie, their Oxford Secretary. The former has been more concerned with the scholarship scheme in the larger phases, while the latter, previously a tutor and fellow in one of the Oxford colleges, has had a personal and intimate acquaintance with every Rhodes scholar who has gone to Oxford. The subdivision of the task is, therefore, a particularly happy feature of the book, and one does not know whether to be more grateful for the chapters that deal with the broader phases of the scheme or with those on *The University System* and *The Social Side of Oxford Life,* which give us the educational and social atmosphere of the scholar as could be done only by an Oxford man who brings to his task the points of view of strangers who come from around the globe.

Since the scholarships became realized possessions there have been articles and criticisms innumerable about the recipients, most of these aimed at the American Rhodes Scholars. Some have been just; some have been beside the mark, aimed at the scholars but criticising not so much the individual men as the educational systems which produce their type of scholarship; some, again, have been premature, as, for example, when the failure of the American Rhodes Scholars to 'make good' after their return to this country was heralded in one magazine of good standing in the spring of 1907. Several scholars who received appointments in the winter or spring of that year were warned of the danger of coming back, as their predecessors had done, unfitted by three years of Oxford for the duties and privileges of American citizenship. Presumably, neither the magazine which published this article nor those who drew their warnings from it, were aware that at that time the first appointees from America were still resident in Oxford, their three years' tenure not expiring until June, 1907. Not a few of the subsequent criticisms have been as glaringly premature, not to mention those which have been ludicrously misdirected. No one should suppose that the scheme has been tried long enough to test its successful working. The oldest Rhodes Scholars have been away from Oxford less than six years, and we need not be frightened by the critics' assurances that these returned scholars have not yet revolutionized thought and affairs on this continent.

We are grateful for a treatment which takes us straight to the heart of the Rhodes Scholarships; which gives us the motives that induced an empire-builder and one of the most colossal 'practical' men of affairs and action to give a large part of his life endeavor to the educational scheme which he considered worthy of his fortune and his faith. The dream was his; the realization is ours if we can rouse ourselves to the loftiness of his imagination. The lack of interest in the scheme, the prevailing ignorance about the conditions and possibilities of the scholarship, the ignorance of how much Oxford can mean, and of how much in addition to Oxford a Rhodes Scholarship can and should mean, is sad testimony to the fact that we have not yet awakened to the grandeur of the possibilities which are offered to the college men of America as well as to those of Germany and of the British Empire.

W. D. WALLIS

Die Bedeutung der Psychologie für die übrigen Wissenschaften und die Praxis, von K. MARBE. Fortschritte der Psychologie und ihrer Anwendungen, 1912, vol. 1, pp. 5-82.

This article forms the *pièce de résistance* of the initial number of the new journal edited by the author,—*Fortschritte der Psychologie und ihrer Anwendung.* It is essentially a plea for wider recognition of the importance of psychology, in view of the significance which this science has for other sciences, both pure and applied. Without attempting to treat exhaustively the relations of psychology to other sciences, Marbe aims to point out certain definite ways in which knowledge of the facts revealed by modern psychological investigation would be useful to the natural scientists, the student of medicine, the philologist, the aesthetician, the historian, the pedagogue, the student of jurisprudence and national economy, and to the philosopher.

In astronomy, mathematics, and physics, consideration should be given to errors of space and time, and to inaccuracies resulting from the 'personal equation.' The fact of the predeliction for certain errors is significant for any observational science, and also for mathematics, in that it undermines the assumption of the Gaussian theory of errors, that all errors are equally probable. The whole question of the reaction-time and its influencing factors is of vast importance to observational science. Moreover, as difference sensitivity is greatest at medium intensities, it is desirable that when stimuli are to be compared, those of medium intensity be selected. Blondlot's alleged discovery of the n-rays rested upon illusions well known to the psychologist.

For the ethnologist and anthropologist, the exact methods of modern psychology are valuable in the investigation of the mental life of primitive man, as Myers and Rivers have shown.

In stethoscopy, certain errors of audition, such as the overlooking of weak sounds just before, and especially just after, more intensive sounds, must be considered. The relation of psychology to hygiene appears nowhere so clearly as in the employment of psychological methods of investigating the effects of fatigue. In psychiatry, the importance of psychological methods for the diagnosis of mental diseases is apparent in the work of Sommer, Jung, and others; moreover, their importance for the investigation of the peculiarities of the abnormal mind is unquestioned. Pick has long been engaged in explaining mental abnormality in view of the similarities to normal life which it exhibits, regarding many pathological activities as retardations or exaggerated developments of normal mental phenomena. The psychiatrist who lacks knowledge of normal mental phenomena is in much the same position as a physician who studies pathological structures, without knowing his normal anatomy.

For the science of language, philology, and the literary sciences, psychology is of marked importance. Child psychology, in the parallelisms it reveals between the development of speech in the child and in the race, can throw much light on the origin and development of speech. The method of introspection has gone far in clearing up the relations between speech and thought, and the question of the understanding of speech. The discovery of the fact of preferred associations, especially those revealing psychological connections between words analogous in speech usage, is significant for the investigation of speech analogies. The philologist may obtain great assistance in the evaluation of ancient manuscripts, and in avoidance of impossible conjectures, from knowledge of the errors commonly made in copying. The question, moreover, of literary style is a psychological one; so, too, is that of the aesthetic effect of language, depending as it does upon the rhythm of the text, the dialect, and the rate at which it is read, on the objective side, and upon mood, on the subjective side.

Especially important for the historian is the psychology of testimony; for him, also, the fact of the uniformity of mental processes under similar conditions is significant. The historian, depending for his sources upon spoken or written testimony, ordinarily assumes that coincidence of two independent accounts of an event establishes its historicity. This assumption it appears is not justified, for often the same error is made by several individuals in describing an event. Investigators of the psychology of testimony have pointed out a number of specific tendencies to falsify in description; and the changes which occur in repetitions of description are well known. Again, realizing that mental phenomena in different individuals under similar conditions show a marked uniformity, the historian will understand that similar development in different peoples does not necessarily mean interdependence in that development.

Both child and adult psychology are of service to pedagogy. Psychological tests of the effects of different systems of education are essential. Training must be adjusted to the child's development; in order to accomplish this the mental equipment of the child at different ages must be understood. Studies of memory and learning are of obvious importance.

In jurisprudence, such questions as those of fixing responsibility of contracting parties, or of criminals, are closely bound up with the psychology of the will, and factors which influence it,—unconsciousness, alcoholism, emotion, and suggestion. For determination of guilt, there is the *Tatbestanddiagnostik* of Jung and Stern. The psychology of testimony, again, and the effect of questioning, are essential for proper evaluation of the statements of a witness. For national economy, the discoveries regarding the work-curve, and individual work-tempos, which if followed result in increased efficiency, are important. There are indications that psychology may, in time, be useful in determining the profession most suited to a youth.

For critical evaluation of past philosophical systems, and for the construction of new ones, the findings of modern psychology are absolutely essential.

Marbe concludes with a brief sketch of the consideration given psychology in examinations for professorships and the professions of medicine and law; he finds that the official recognition accorded is by no means in keeping with the importance of the science, and recommends courses in psychology for professional students. Such courses would necessitate improved facilities for psychological instruction in the universities, only two or three of which (in Germany) possess at present adequate psychological departments.

The bibliography, given in foot-notes, numbers nearly 400 titles; it includes accounts of the psychological investigations along the different lines mentioned as significant for various sciences, and of contributions directly concerned with the relations of psychology to some other discipline. Although the author's zeal leads him occasionally to overestimate the present applicability of different branches of psychology (for instance, the treatment of the *Tatbestanddiagnostik*), this does not militate seriously against his main position, that psychology offers to workers in other fields both aid, and means of avoiding error.

S. C. Fisher

La simulation du merveilleux, by P. Saintyves. Paris, Flammarion, 1912, pp. 387. Preface by Pierre Janet and bibliography on the cures at Lourdes.

The author divides his material into three heads: simulated diseases; simulation of supposed supernatural morbidities; simulation of miraculous cures. The first includes diseases simulated by beggars, neurotics, hysterical persons, etc.; the second, spiritism in its various forms, occultism, demoniac possession, false ecstasies, fastings, prophecies, stigmata, pregnancies, etc.; the third, various forms of miraculous cures, the cure of simulated diseases, and the pretended cure of a disease already cured. Here especially the cures at Lourdes are discussed, and one of the most celebrated cases, that of Pierre de Rudder, which was officially sanctioned only four years ago, in 1908, is classified as a pretended cure of a disease already cured. This section is especially interesting as showing the character of the evidence accepted in investigating a cure here, the testimony of various witnesses being quoted at length.

The book should serve a useful purpose in putting people on their guard against all claims to the supernatural; if science has advanced, the industry of simulators has done likewise, and the more marvelous a phenomenon appears the more severely should it be tested and verified. The motives for simulation are not always apparent, nor are they always such as would move the normal man. So much the more therefore, should the person laying claims to supernatural relations be tested by psychological experts and alienists, as well as by men of science, the laity and the faithful. The reader should note that Janet in his Preface takes exception to the author's classification of certain apparent neurotic and hysterical simulations along with the other frauds. He does not believe these patients so simple nor so culpable morally. Indeed, it also seems as if the author in his discussion of mediumistic phenomena, hardly does full justice to the morbidity of the subjects. He asserts that there is always a memory of the mediumistic state in the normal state—which certainly has not been demonstrated but is much open to question. The same is true of his discussion of mystics and ecstatics, and accordingly he attaches greater importance to the part of fraud in founding religions than most people would. The central persons in such movements he seems to consider chiefly deceivers, or else deceived and taken in hand by some shrewd deceiver who uses them to his own advantage. But some of the cases would appear to disprove his own statements, as in spiritism. Every one knows that the Fox Sisters confessed their deceptions—but did that injure spiritism? Again and again mediums are exposed or confess, but the belief persists. It has a deeper basis than the objectivity of facts about which lies are possible, just as to-day Christians are beginning to realize that Christianity has perhaps a deeper basis even than the historical existence of Christ. One is tempted to a figure of speech. To the average, healthy minded person who has dabbled a little in spiritistic and other present day superstitions, they come to seem like malodorous, gangrenous cancers in the minds of their victims. At present the only known cure is surgery, and this must come in the very early stage to be efficacious. Like cancerous tissue, they can be transferred from one mind to another, and become more virulent with each transfer. Their very persistence, vitality and rapid multiplication show what a primitive and low form of mental life they are.

But the fact that we as yet only theorize as to their origin and can hardly at all control their growth and spread should make modern science and religion ashamed. Can not their vitality and endurance and power of growth be used to make healthy social tissues instead of cancers?

Amy E. Tanner

Le langage graphique de l'enfant, by Georges Rouma. Misch et Thron, Bruxelles, 1912, 304 p., with numerous illustrations and bibliography of nine pages.

Dr. Rouma's study of this subject began in his collaboration with Karl Lamprecht in collecting large numbers of drawings in order to show the parallel between individual and race development. He came, through these studies, to believe the similarities between the two superficial and the differences deep, and also to believe that drawing is a most valuable indication of the mental condition of the artist. Accordingly he obtained still more material and has published the results in this volume. Incidentally he summarizes most of the other work done in this line.

His own method of obtaining material was that of watching the children drawing under various conditions. Sometimes they chose their own subjects, sometimes had them assigned. Their remarks were noted on the paper, and both normal and feeble minded children were observed.

Before drawing proper begins there is a preliminary stage of adaptation of the hand to the pencil. The pencil is grasped in the whole hand, the point perpendicular to the paper, and the lines are usually dim and short, running in all directions. In abnormal children this may last for months, but in normal the lines soon grow blacker and longer, and urged by those about him to draw a picture, the child begins to attach names to his scrawls, without seeing any likeness or being able later to remember what he called them. First he accepts suggestions from those about him, and then himself enunciates what he intends to do. All this is purely arbitrary until he chances to see a similarity between his scrawls and some object, and then first his drawing may become true drawing at times, though with frequent lapses to the earlier stages. This occurs between the second and third years usually.

Rouma next takes up in great detail the stages in drawing the human figure. After the preliminary stage, follow Sully's tadpole stage, and the drawing of the man full face, with gradual inclusion of the various details. The transition from full face to profile comes later and is made with difficulty, with various combinations of the two. Animal drawings are naturally usually profiles, and follow in general a development like that of the human figure. Birds are drawn relatively little.

Comparing with primitive people, Rouma says there is no preliminary stage with the latter, for adults have naturally had sufficient practice to handle the pencil and to see resemblances. We do find all the stages in drawing the human figure in the collections of savage and primitive drawings, but also great differences among individuals, some far excelling children. We then have the difficulty of determining the average for the tribe, and are likely to fall into absurdities if we judge the civilization by the drawing, because a people may be highly developed industrially and little developed as to drawing.

In the beginning there is complete lack of proportion between the parts of the child's drawing. New and interesting details are exaggerated. Attempts to represent movement mark considerable advance. At first the child does not draw it, but acts or describes it as he draws. Then it is represented by some part, like an arm, unduly prolonged to meet another part, and somewhat later, the child tries to note how a moving leg or arm looks, and to draw it in the position. Here we pass from drawing language to visual representation, an important transition. For some time this may be tried only with one object, and the results may vary greatly. Sometimes a series is drawn showing successive stages of the movement.

Among the difficulties of the child is that of orientation, placing the objects in right relations to each other on the paper. This he has to learn, and in learning he may turn the paper round in drawing, draw objects upside down, etc. Perspective is still harder. The child naturally tends at first to draw what he knows rather than what he sees, and when he begins to appreciate the difference, he produces hybrid combinations. The transition usually occurs between 7 and 9 years. At first objects are thrown in helter skelter; then there is a tendency to group them along a straight line, all the objects being perpendicular to the point of view; the child attempts to indicate the relation between various parts, as if he had made the drawing from several viewpoints; and finally the child tries to get true perspective, aided by pictures, but very few get any satisfactory results without instruction.

Considering drawing as a language, we have already noted the indicative stage, and the representative stage, and referred to the tendency to complete the drawing by words and actions. With greater technical skill and more sustained attention, this tendency is favored and may become true acting. On the other side, it leads to simplifying the drawing, reducing the details in drawing the man, selecting characteristic or symbolic details and exaggerating them, all this of course leading to a conventionalizing of the drawing, and this just in proportion as the child narrator is imaginative, and quick in thought. Here too we get what Barnes calls fragmentary thinking, but which Rouma thinks is rather fragmentary drawing only, the thought appearing fragmentary only because the spoken or acted narrative which went with the drawing has been left out.

Rouma attaches great value to drawing as an indication of the mental development, when all the spontaneous drawings are preserved so that the changes in the course of a year can be studied. He believes that a regression to an earlier type should lead us to call in the physician, and that the mental instability and slow advance to higher stages are indicated in the drawing of mentally disordered or feeble-minded children. Similarly he believes it a valuable index of the normal and disordered imagination, the sense of humor, and the moral environment.

The behavior of the child while drawing is also very suggestive. The strong visualists, who have also a certain degree of skill, show every sign of strong attention, erase much, and work in silence, but most children talk freely while drawing, and oscillate from one design to another, and the few motiles act out the parts of their rigid and stiff figures. When they meet difficulties in the drawing, they may either avoid them by making another turn to the story, or laugh at their grotesque drawing, or observe carefully, and continue attempts to get a better drawing. If their attention is called to a fault, they may either correct or justify it.

On the side of technique, children begin by grasping the pencil in the hand without using the thumb; some use both hands indifferently. The part first drawn is usually what they think most important, but often there seems no reason for the order followed.

The development of voluntary attention shows very nicely in the series of drawings of a child. It progresses from the vague to the definite, and along with the adaptation of the hand to definite movements goes a tendency to automatisms, which leads to the curious mixtures of full face and profile, etc. In some instances, instead of later adaptation occurring, the automatism increases, the idea drops out, and the drawing degenerates to a lower stage. In other cases, the child is pleased with the result, and repeats it many times for the mere pleasure.

In conclusion, spontaneous and free drawing is a most valuable aid in mental development, and should be wisely encouraged, not forcing the child prematurely into technique or to subjects foreign to his interests, but employing it as a language closely bound up with speech and music. AMY E. TANNER

Folk Festivals, Their Growth and How to Give Them, by MARY MASTER NEEDHAM. N. Y., B. W. Huebsch, 1912, 244 p. Bibliography of four pages.

This book should be very serviceable to teachers in showing them how to set about preparing for a folk festival and what subject to choose, when the pupils are the participants. The book is very concrete, giving many illustrations of what the writer has done, the difficulties involved, the effects on pupils and parents, and the educational possibilities in such work. The range is shown by the chapters: the pioneer festival, the spirit of the festa, our festal heritage, choice of subject, festivals in connection with playgrounds and schools, and the psychological effects. Out of folk art has grown fine art. In the folk tale, dance and play there is the recognition of truth and the basic things of life that are the source of great literature and art. Not only that, but the folk festival helps the participants to become free and so creative, prolongs mental and emotional growth, breaks down barriers of race and class and so makes for a greater democratic unity. AMY E. TANNER

Nervousness of Young Girls. MARGARETA DÓSAI-RÉVÉSZ. *A. Gyermek:* The Child, Official Organ of the Hungarian Society for Child Study, Vol. VI, 1912, No. 2.

Nervousness is a condition which presents many symptoms and appears under different forms in adolescent girls. Usually the ailment manifests itself through headaches, aural hallucinations, and uncertainty of mind, or lack of steadiness of purpose. In other girls the somatic manifestations include palpitation of the heart and pains more or less pronounced along the vertebral region. Such girls have restless nights and nightmares. Their intellectual life is subjected to sudden changes; the girls are said to be 'of many moods.' This symptom is rather characteristic. It serves to distinguish the psychic condition of nervousness from purely physical ailments.

The contention is made that the nervous system of woman is more 'sensitive' than that of man from the earliest stages of life. This sensitiveness is increased later, on account of the peculiar function of woman's organism. It is not necessarily a weakness though the sensitiveness may lead to weakness, if abused. Woman's peculiar sphere of activity and duties often react detrimentally upon her nervous system.

During certain periods, peculiar to her sex, woman always presents certain nervous symptoms. At such times her physical energy and her nervous resistance are diminished even under the best circumstances. With the advent of maternity her system undergoes a still greater depletion of energy. Many of the nervous symptoms in the adolescent girl are due to the abuse of imagination along the lines of her future vocation as a housewife.

Whatever a young woman may be trained to do, her education should be conducted along lines best calculated to conserve her physical and psychic forces for the maternal rôle she is to assume in life.

The teacher's health; a study in the hygiene of an occupation, by LEWIS M. TERMAN. Boston, Houghton, Mifflin Co., c. 1913. 137 p.

Medical directors often find teachers afflicted with tuberculosis, asthma, deafness, defect of vision, neurasthenia, mal-nutrition, heart disease, anaemia, and other troubles. Although warnings have been sounded in various times and places, medical inspection in the schools is still chiefly for the benefit of the pupils. It was natural if not inevitable that they should have the first attention, but it is fortunate that of late the health of teachers is receiving its due share. The writer here attempts to summarize the most important investigations that bear upon the hygiene of teaching and seeks to make certain contributions toward the conservation of the teacher's health by pointing out the sources of danger with suggestions for a better personal hygiene. He would also waken administrators to the desirability of concerted action to keep up the tone of the profession. He first states the problem, then mortality rate and physical morbidity. Then follow tuberculosis and the teacher, the teacher as neurasthenic, the margin of safety, health suggestions for the teacher, the hygiene of character, responsibility of the normal school, and then a bibliography of twenty-six titles on the teacher's physical health, twenty-five on mental health and the hygiene of character, and finally a list of fifteen best books on personal and mental hygiene, especially selected for teachers and students.

Psychology and industrial efficiency, by HUGO MÜNSTERBERG. Boston, Houghton, Mifflin Co., 1913. 321 p.

This book, we are told, although not a translation, corresponds to a book of the author which recently appeared in German. He tells us that "the essential substance of the two books is identical." After an introduction treating applied psychology generally, the demands of practical life, means and ends, the first of the three parts treats the best possible man, discussing vocation and fitness, scientific guidance, management, methods of experimental psychology, the author's experiments in the interests of electric railways, ship service, telephoning, contributions from men of affairs, individuals and groups. The second part treats the best possible work, under which fall such captions as learning and training, the adjustment of technical to psychological conditions, the economy of movement, experiments on monotony, attention and fatigue, physical and social influences on the working power. The third part, entitled the best possible effect, treats of the satisfaction of economic demands, experiments on the effect of advertising, display, illegal imitation, with final chapters on buying and selling and the future development of economic psychology.

We regret that the author still adheres to his avowed policy of almost utterly ignoring all the literature in this vast field, so that, as in his "On the Witness Stand," the reader who makes his first acquaintance with the subject through this rather popular book might easily think the whole thing the author's own creation, while those who want to pursue the different lines further would have no guide. This method we do not consider in accordance with the good customs of modern science, to say no more. In the next place, the author makes what the writer of this review deems very extravagant claims for his science and for his tests in these fields. This is all the more regrettable in view of the author's early, many condemnations of about all applications of psychology, which suggests the perfervid zeal of late converts to make up for early faults and remissnesses. But third, the real core of the book, and about the only part where the author has sought to make additions and by which the value of his work must be judged, is the actual tests he has devised for street railway employees, telephone girls, ship service, etc., together with some parts of the chapters on advertising, display, and illegal imitation. Here we are given to understand that business men most deeply concerned have given hearty and almost unreserved commendation of the services of the tests applied. This of course is the chief question, whether psychology can actually help industry in this way. If it can do so, industry, being the occupation of most of the intelligent men of the civilized world, will owe it an immense debt. To analyze industrial processes to their elements would be of itself a great achievement and then to devise real and standard tests for efficiency in all of them would be a boon to the world, but we are not convinced that the author has succeeded nearly as far as he thinks in either of these processes, although we heartily grant that he has made a very valuable and indeed a most stimulating contribution which merits the serious interest of all psychologists who are not too entirely absorbed in introspection to be concerned with practicality.

The principles of science; a college text-book, by WILLIAM FORBES COOLEY. New York, Henry Holt & Co., 1912. 245 p.

This book is divided into three parts: 1. treats of methods, including the character of scientific knowledge, motives, principles, positivism, scientific analogy, criteria of truth; part 2. is empirical principles, such as matter, quantity, energy, law of evolution; 3. basic principles, rationality, the external world. The author defines his little book as an "attempt to bridge the chasm" between scientific and philosophical studies. For our part while we believe it is very important to acquaint philosophers with even the general principles of science, we cannot for one moment believe that this way of approach for young people of college age is the right one, but believe it rather the reverse of true. Science is empirical and should not be approached with abstract ideas first. This is to make it not empirical but speculative. We believe the time has gone by for this sort of thing.

State of New York. Eighth Annual Report of the Education Department, for the School Year Ending July 31, 1911. Albany, 1912. 1138 p.

This report, besides the usual statistics, contains an account which will be interesting to many, entitled "The Story of the Erection of the Education Building." This is "the only building erected by any state or foreign country for the exclusive use of its educational activities," and we are told that the whole scheme from its inception to its completion was without the least public scandal and within the cost originally set apart for its erection. The mural paintings which are to adorn the great staircase and the rotunda are to have for their title "The Aspiration of Man for Intellectual Enlightenment and the Results of Its Attainment." There are thirty-two panels with some seventeen hundred and thirty square feet to be decorated. Fifteen of these spaces may contain developed compositions of several figures, while four will permit the use of only one, so that the others must be treated with decorative ornament. The total cubic space within the building is some eleven million feet, while that within the Capitol across the way is some fourteen million. The contract for the entire work was let July, 1908, for a little over three million dollars and work was begun a few days later. By the contract it should have been done January 1, 1911, and had it been ready the collections of the Education Department would have escaped serious injury by the fire that destroyed the west half of the Capitol in March, 1911. Almost nothing was done in the winters before 1911-1912 and there were many conflicts between the architects and builders. A law provides that it shall always be occupied exclusively by the Educational Department, including the University, the State Museum, the State Library, together with the other work of the Commissioner and Regents. At the writing of this report the building was not yet finished and occupied.

Art museums and schools; four lectures delivered at the Metropolitan Museum of Art, by STOCKTON AXSON, KENYON COX, G. STANLEY HALL and OLIVER S. TONKS. New York, Charles Scribner's Sons, 1913. 144 p.

The object of these lectures, given in the spring of 1912 at the Metropolitan Art Museum in New York, was to show teachers in the various departments of school work how the museum collections might be used by them in connection with the teaching of their subjects. Mr. Axson shows the relation between the art museum and the teaching of English, Mr. Cox shows how teachers of art may use it, Mr. Hall how teachers of history, and Mr. Tonks how teachers of classics may make use of its collections.

Bibliography of child study for the years 1910-1911. Compiled by Clark University Library, Worcester, Mass. United States Bureau of Education, Bulletin, 1912, No. 26. Whole No. 498. 90 p.

For many years, Dr. Louis N. Wilson has printed a comprehensive and discriminating bibliography of child study that has proven invaluable to all interested in it and has done much to advance the cause. The work was first printed in THE PEDAGOGICAL SEMINARY, but the literature has constantly grown in extent, as has also the interest and demand for bibliographical work. Accordingly, the Bureau of Education recently undertook to print this bibliography and to give it a wider circulation. This annual report comprises 90 pages and nearly 2,000 titles.

The secularization of American education, by S. W. BROWN. New York, Teachers College Contribution to Education, 1912, No. 49. 160 p.

This interesting theme is well treated, starting with the religious aim of education and its operations with orphans, inmates of reform, industrial and penal institutions, the old ecclesiastical control, state support of schools owned and controlled by the church, association of religion and education in the public mind, laws prohibiting religious training and the establishment of departments of theology, laws forbidding sectarian text-books, the establishment of religious tests and the appropriation of public funds to schools under ecclesiastical control, constitutional provisions concerning the aim of education and those forbidding sectarian instruction, religious tests, state and supreme court decisions favoring religious ideals of education and those favoring secular ideals.

Rivista di Filosofia, Neo-scolastica, pubblicata per cura di un gruppo di studiosi diretta dal dott. AGOSTINO GEMELLI. Anno IV. N-5, 20 Ottobre 1912.

The present number contains the following articles, The gnoseological doctrine of St. Thomas in the actual moment of philosophic consciousness, by D. Lanna: Psychology and pathology, by A. Gemelli: God in the philosophy of St. Bonaventura, by F. Palhorüs: The philosophy of Benedetto Croce, by E. Chiochetti: The modern philosophy of thought according to O. Külpe, by A. Gemelli: Benedetto Crose and the presuppositions of the gnoseology by Gian Battitta Vico, by Be.: The ancient scholasticism according to a new scholastic, by B. Nardi: The idealism of the Marburg School, by Fr. Olgiate: Professor G. Gentile and the Italian Thomism from 1850 to 1900, by A. Masnovo.

Why women are so, by MARY ROBERTS COOLIDGE. New York, Henry Holt & Co., 1912. 371 p.

This book is good reading by an author who has evidently given great attention to the present and historic aspects of the subject, who writes in a vivacious way through all her sixteen chapters, divided into four sections, viz., domestic traditions, the effects upon women, some exceptions, and from femininity to womanhood.

Elementary biology, plant, animal, human, by JAMES EDWARD PEABODY and ARTHUR ELLSWORTH HUNT. New York, Macmillan Co., 1913. 229 p.

This is an interesting and excellent text, with many, although we wish there had been more, illustrations, which is well calculated to bring this subject within the interests of daily life and human sympathies instead of making it abstract, academic and ultra-scientific for the beginner.

Addresses and papers, by ANDREW S. DRAPER. Albany, New York State Education Department, 1912. 266 p.

We have here some twenty different addresses and papers. Some of them were for special occasions, others apparently written more in a recreative mood, covering quite a variety of topics, mostly however connected with the administrative aspects of education.

Carlisle primer, by KITTIE ROSE CARLISLE. Illustrated by Adèle Laure Brunet. Houston, Texas, Rein & Sons Co., 1912. 118 p.

The author premises that the greater part of the child's first reading is learning to read and not reading to learn. To make this learning to read interesting and easy is the main object of this book. The writer also assumes that the chief interest of the child on entering school is in himself and in those things with which he comes in natural contact in everyday life, his school, home, food, clothes and other children; whatever relates to his own experience and environment will claim his attention and the things most closely connected with child life have been selected for the subjects of the lessons. The simplest words in the child's natural vocabulary too have been chosen. This seems a sound idea but it seems to be only in part carried out, unless the child is a country child and familiar with the animals, birds, etc., of the country. The preface is by way of suggestion that the Mother Goose rhymes should be read as a whole and memorized. Some things can be dramatized (a good new idea). It is well, too, to confine for the most part the words in the primer to the vocabulary of the child but to do this is a scientific matter and involves a specific method, of which there is no trace in this book. Nor is much attention paid to the recent psychological studies of the forms of letters, although it is a merit that the importance of this subject is at least seen.

Mental fatigue, by TSURU ARAI. Teachers College, Columbia University Contributions to Education, No. 54. New York City, Teachers College, 1912. 115 p.

After an introduction and historical sketch the author formulates her problems as follows, four in number, showing the influence of mental work upon physiological processes, on the feeling of fatigue and on efficiency. Her conclusions are interesting but not of the utmost value.

A text-book in the history of modern elementary education, with emphasis on school practice in relation to social conditions, by SAMUEL CHESTER PARKER. Boston, Ginn, 1912. 505 p.

The principles followed here are intensive treatment of a limited field, emphasis on a relatively few selected movements, institutions or individuals in this field, and third, discussion of the chosen topics in such a concrete way as to help the student to appreciate the reality of historical development. The author begins with the vernacular in the middle ages, then discusses elementary schools on a religious basis, the transition to a secular basis from Comenius. In the twelfth chapter he comes down to the development of American secular school systems. Several chapters are given to Pestalozzi and a good deal of space to Herbart and Froebelians, with a few sentences or pages about a few living men. It is greatly to be wished that there were more of the latter. Indeed there is nothing contemporary or anywhere near it in the book except what is said about contemporary Froebelians. Most of the material is old and has been worked over and over again. Perhaps it might be said that the author's *Bearbeitung* is as good as anybody's in English within its space, and we do not recall any that has quite so many illustrations of ye olden days.

History of Plymouth Plantation, 1620-1647, by WILLIAM BRADFORD. Massachusetts Historical Society, 1912. 2 v.

This is a really monumental work. It is not only elegant but in excellent taste and abounds in illustrations of many kinds. It is a great credit to the Massachusetts Historical Society.

The conservation of the child; a manual of clinical psychology presenting the examination and treatment of backward children, by ARTHUR HOLMES. Philadelphia, Lippincott, 1912. 345 p.

After an historical sketch the writer treats the constitution of the clinic and its function psychologically and in the field, operations, classification of clinic cases, and modes of classifying both them and moral deviates, and finally sociological relations of the clinic.

Stuttering and lisping, by E. W. SCRIPTURE. New York, Macmillan, 1912. 251 p.

The author has made himself one of our very best experts. Particularly interesting is his treatment of lisping. The book abounds with illustrations, curves, etc., which really bring together the best that is known upon the subject, and the work concludes with detailed characterization of modes of treatment.

A study of mental fatigue in relation to the daily school program, by W. H. HECK, Lynchburg, Va., J. P. Bell Co., 1913. 28 p.

The Beacon primer, by JAMES H. FASSETT. With illustrations by G. A. Harker. Boston, Ginn & Co., 1912. 120 p.

Cyr's new primer, by ELLEN M. CYR. With illustrations by Ruth Mary Hallock and Alice Beach Winter. Boston, Ginn & Co., 1912. 121 p.

Current Educational topics. I. *The duty of the State in the medical inspection of schools,* by F. B. DRESSLAR. II. *Health problems in education,* by THOMAS D. WOOD. III. *Sanitation in rural communities,* by CHARLES E. NORTH. Washington, Gov't. Printing Office, 1912. U. S. Bureau of Education, Bulletin, 1912, No. 24, Whole No. 496. 25 p.

Public and private high schools. Prepared by the Statistical Division of the Bureau of Education. Washington, Gov't. Printing Office, 1912. 375 p. Bulletin, No. 22, Whole No. 494.

Outlines of European history. Part II. From the opening of the eighteenth century to the present day, by JAMES HARVEY ROBINSON and CHARLES A. BEARD. Boston, Ginn, 1912. 555 p.

Outlines of the history of education, by GEORGE WASHINGTON ANDREW LUCKEY. 2d ed. revised. Lincoln, University of Nebraska Press, 1912. 147 p.

Willie Wyld hunting big game in Africa, by WILLIAM JAMES MORRISON. Nashville, Tenn., M. E. Church, 1912. 131 p.

Public and private high schools. U. S. Bureau of Education Bull., 1912, No. 22. Washington, Gov't. Printing Office, 1912. 375 p.

The secularization of American education as shown by state legislation, state constitutional provisions and state supreme court decisions, by SAMUEL WINDSOR BROWN. Teachers College Contributions to Education, No. 49. New York, Teachers College, Columbia University, 1912. 160 p.

The American Antiquarian and Oriental Journal. October-December, 1912. Vol. XXXIV, No. 4. Benton Harbor, Mich., Antiquarian Publishing Co., 1912. pp. 265-351.

Mornings with masters of art, by H. H. POWERS. Chautauqua, N. Y., Chautauqua Press, 1912. 461 p.

Home life in Germany, by Mrs. ALFRED SIDGWICK. Chautauqua, N. Y., Chautauqua Press, 1912. 337 p.

Social progress in contemporary Europe, by FREDERIC AUSTIN OGG. Chautauqua, N. Y., Chautauqua Press, 1912. 368 p.

The spirit of French letters, by MABELL S. C. SMITH. Chautauqua, N. Y., Chautauqua Press, 1912. 374 p.

COMMUNICATION

Apropos of the allusion to Norbert Wiener in our last issue (December, 1912, page 463), we are glad, in accordance with the wish of Norbert Wiener and his father, who took exception to Miss Dolbear's statements, to print the following letters supplied by them.

HARVARD UNIVERSITY
THE GRADUATE SCHOOL OF ARTS AND SCIENCES
24 UNIVERSITY HALL, CAMBRIDGE, MASSACHUSETTS

12 *February,* 1913.

DEAR PROFESSOR WIENER:

In response to your request for a statement of the record of your son Norbert Wiener in the Graduate School of Arts and Sciences of Harvard University I beg to state that he entered the Graduate School of Arts and Sciences in September, 1909, and that he has pursued graduate studies here since that time with the exception of the year 1910-11, which he spent at Cornell University. His record in courses for the years 1909-10 and 1911-12 is as follows:

1909-10			1911-12		
Physics C	B		Philosophy $5a^1$		A
Botany 2^1		B	" 8	A	
Zoölogy 3	B		" 20c	B	
" 4^1		C	" $20e^1$		A
" 11^2		A	" 22^2		B
			" $14a^2$		A

Mr. Wiener holds this year a University Scholarship, and has been accepted as a candidate for the degree of Doctor of Philosophy in June, 1913.

Sincerely yours,
(Signed) CHARLES H. HASKINS.

HARVARD UNIVERSITY
THE GRADUATE SCHOOL OF ARTS AND SCIENCES
24 UNIVERSITY HALL, CAMBRIDGE, MASSACHUSETTS

18 *February,* 1913.

DEAR PROFESSOR WIENER:

The record of your son, Norbert Wiener, as contained in my letter of 12 February should be supplemented by the fact that he received the degree of Master of Arts from Harvard University in June, 1912. I may add, also, that as a candidate for the doctorate in the Division of Philosophy Mr. Wiener has successfully passed the preliminary examination required of candidates for the degree in that Division.

Very truly yours,
(Signed) CHARLES H. HASKINS.

TUFTS COLLEGE
DEPARTMENT OF ARTS AND SCIENCES
OFFICE OF THE DEAN
TUFTS COLLEGE, MASSACHUSETTS, *February* 13, 1913.

Mr. Norbert Wiener was admitted to the A. B. Course at Tufts College in September, 1906. On date of June 25, 1906, the Principal of the Ayer High School wrote as follows to William R. Shipman, who was then Dean of this institution. "I consider his educational training as thorough and perhaps broader than that of the average man entering college, but in many ways he is a boy of eleven. If you can consider his age in some ways (not in educational standards) I am sure he will get along all right."

Dean Shipman accepted the boy, and the problems which his age presented to the College were satisfactorily adjusted by having his family move to the vicinity of the College so that he could live at home during his college course. He received fifteen Carnegie units in entrance credits, and pursued a college course for three years at Tufts College, receiving the degree of A. B. in June 1909. This degree was awarded "cum laude," and he received honorable mention in Mathematics.

His course while at Tufts was as follows:

	Semester Hours
Latin	12
Greek	24
French	6
German	12
English	6
Philosophy	18
Economics	6
History	6
Mathematics	18
Physics	6
Chemistry	9
Biology	6
Total	129

He attained the following grades:

A in 51 semester hours
B in 69 semester hours
C in 9 semester hours

His major department was Philosophy, although he did a great deal of work in Mathematics.

The instructors at Tufts College found him better than the average student in classroom work. In the Department of Chemistry the first subject which he pursued was Chemistry 10, which ordinarily requires three subjects in the department as prerequisites. The fact that he obtained A in this subject shows that he was capable of doing the work without having formally studied the usual prerequisites. The only criticism which the Tufts College faculty has ever made against the boy was the fact that he was immature physically. There seems to have been no question concerning his mental development.

(Signed) FRANK G. WREN,
Dean.

NOTES

MUTUAL ASSISTANCE SOCIETY OF THE MOSCOW TEACHERS' INSTITUTE.

Report of the 17th year, Sept. 1, 1911 to Sept. 1, 1912 (in Russian).

On September 15, 1911, the Committee for the Study of Children's Drawings met (for the second time) in Teachers' Hall. Mr. N. A. Rybnikov reported on the collection of children's drawings in Teachers'

Hall. They were collected according to a definite program so as to show the creative capacity of children according to sex, age, social condition, and also to show the improvement in quality with age. The collection consists of thirty thousand drawings, chiefly from country schools, with a very few from city schools. The Pedagogical Museum of Teachers' Hall takes also into consideration the collections existing elsewhere, such as those at Munich, Leipzig, Geneva, Antwerp, Budapest, and a few other cities. Particular attention has been given to the Geneva collection due to the initiative of Professor Claparède, whose program served as a model for that of Teachers' Hall. Messrs. Katsarov and Ivanov gave information about the new improvements in the Geneva collection, such as the question of what subjects the children select for their drawings, their interests, the sphere of their representations, etc. Mr. Rybnikov noticed a relation between general intellectual capacity and the ability to draw. Unintelligent children very seldom draw well. A child's drawing has to be considered as a particular kind of intellectual work, the level of which depends on the intellectual development of the child. A child's drawing is a particular kind of speech which indicates its psychic level. Mr. R. M. Solovier remarked that too much attention has been paid to collecting and too little to the systematic study of the individual child's creative capacity. The desirability of comparing the results obtained here with those of other collectors was set forth.

A report on the state of the library of the Mutual Assistance Society was presented.

Teachers' Hall was finished in September, 1911, and was opened on December 30, 1911. Lodgings (including hot water and tea) are furnished for teachers at the rate of 50 kopecks (twenty-five cents) a day.

PEDOLOGICAL PROGRESS IN HUNGARY.

The Commission for Pedological Surveys of the Hungarian Child Study Association, at a meeting held on January 12, of last year, under the Presidency of Prof. Nogrady, decided to include the maternal schools in its scheme of inquiry. The teachers will be supplied with questionnaires suitable for the children who frequent these schools.

The Commission plans to outline more definitely the pedological domain which it proposes to cover. The following plans have been adopted:

a.) The statistical investigations of the interests of Children will be continued although on different lines. The first question will be: "Who are the great persons of history you like best? Why?" This investigation will begin with the children of the fourth primary grade.

b.) Investigation of Infantile Memories. "What is the earliest event in your life that you recollect?"

c.) Investigation of Imagination. "How is the Ocean?" "Write a story about some occurrence in the mountains."

d.) The effect of fables on children. "Do you like fable stories? Which one do you prefer?" The older children will be asked: "Have you felt the effect of fables on your spirits? On your actions?"

e.) The investigation of the esthetic taste in children will be continued.

f.) Children's passion for collecting things. The following questions have been proposed: "What do you like to collect? When did you begin to make collections? When did you cease? What do you do with collected things?"

V. T.

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A STUDY OF QUESTIONING*

By SOSHICHI YAMADA, Clark University

PREFACE

Since Socrates the question method has occupied a prominent place in the technique of instruction. "To question well," says De Garmo (19. p. 179), "is to teach well. In the skillful use of the question more than in anything else lies the fine art of teaching." Indeed, "the art of correct questioning has a highly significant effect upon the mental development, ..." (32. pp. 331-332.)

To-day more than two-thirds of the school time is occupied with questions and answers; but unfortunately the general assumption that we know by intuition when and how to ask questions kept investigators from the study of the psychology of questioning until the dawn of this century when the genius of Alfred Binet inspired him to attempt the solution of the problem (6. p. 244). Naturally the majority of teachers whom we hire to put questions to our children ask questions for months and years without ever knowing the psychology of what they are doing, hence without ever taking into account what mental changes a question calls forth, what emotional states it arouses in the pupil's mind, how such resulting states influence the course of ideation and thinking, and so forth. If the teachers do not know anything about these changes, they are not qualified for teachers. Thus it is of prime importance for educators to study the influence of questioning upon answers and upon the mental development of the child.

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*The writer wishes to express his hearty thanks to Drs. W. H. Burnham and Theodate L. Smith of Clark University and to Messrs. Vermille and Butler, principals of the Dix St. and Edgeworth St. schools, for their advice and assistance in this investigation.

General Introduction

The question rightly used is a medium through which a teacher comes into the closest touch affectively with her pupil. The pupil's reaction-time and the mode of reaction to the given question will reveal his mental type and characteristics; for instance, whether he is of visual, auditory, motor, or mixed type; whether his temperament is sanguine, phlegmatic, melancholic, etc.; or again whether he is able to impress something upon his mind (memory) with ease or difficulty, whether he forgets quickly or slowly, whether he can retain a great mass of ideas or only scanty fragments; etc. All these analytical observations are the indispensable task of a teacher in real dynamic education; for this knowledge alone will furnish the principles of individual psychology. Care, however, should be taken that the observations be made scientifically. The teacher, through such diagnosis, will discover technique for further questioning. The question is, thus, a tool for psychological analysis and diagnosis.

Pedagogically, the purpose of questioning is manifold.

1. It is to awaken the pupils to self-activity, to stimulate them to think. It gives a teacher an opportunity for directing and training the thought processes of her pupils.

2. It is to cultivate the fine art of good expression. A habit of clear, concise and discriminating enunciation and of an agreeable intonation is one of the most attractive and highest gifts which any teacher can bestow upon a child.

3. It is a means of testing the depth of the pupil's mind. Through a series of skillful questions, the teacher brings to light the strength and weakness of his knowledge, so that she may find out his intellectual status.

If the aim of the question is to train the processes of thought and expression, what will be the result when a teacher, in one class period, say, of forty minutes, asks over eighty questions (65. p. 11) and gets as many answers? What chance can there be for orderly association and deep accurate impression of ideas, or for a complete expression of thought? Furthermore the nervous tension of the pupils under such a pressure must be considered. A new science of school hygiene has arisen which is dealing with the problem of the physical as well as mental conditions of children in order that they may be able to do more work without injury. But the question as to whether the children may not make better progress in orderly association, originality, and preciseness of thought and expression, if given more freedom and time for thinking and expressing their thought as they have when engaged in their own activities, has not yet received due consideration. Time is required to digest impressions and translate them into clear and definite ideas. Will not a "lack of time and leisure conduce to habits of speedy, but snapshot and superficial judgment?" (20. p. 37.)

I do plead for the millions of the children who now live in agony the school years of their lives because of this dragon of misguided questioning now so universally rampant in our schools. "Every question," says Matthias (41. p. 79), "must strengthen the mental power of the pupil, sharpen his understanding, advance his knowledge, develop his speech-power. Hence one should not put any question, in which the pupil needs to think nothing or little," nor should questions be asked without giving sufficient time for purposive thinking and a complete expression of thought. Is it, however, possible to acquire the art of questioning by practice? It may be a possible attainment with practice of the most intelligent sort, but mere practice, blind and mechanical, however enthusiastic a practitioner may be, will never attain the desired end. Thousands and thousands of teachers practice questioning hourly and daily, year after year, and yet are no better off than when they began. The art of questioning can not be mastered without an accurate knowledge of its fundamental principles. In other words, mere practice is not sufficient to teach one the psychology of questioning.

From this pedagogical and psychological point of view, the writer has studied the relation between question and answer.

Experimental Results

The study of the psychology of questioning is very recent. Since Binet (6. pp. 244-324) attempted the solution of this problem, there has followed a series of experimental investigations among which the studies of Stern, Wreschner, Lipmann, Lobsien, and Borst are specially prominent.

Two methods have chiefly been used: the picture method (*Bildmethode*) and the objective method (*Wirklichkeitsmethode*). In the first the presentation of pictures, in the second objects or events of real life, are used as material in regard to which testimony (*Aussage*) is obtained in two ways: by "free spontaneous report or narrative" (*Bericht*) (62. p. 270) and by asking questions, the so-called "interrogatory" (*Verhö*) or Whipple's "deposition." Hereafter these German terms will be used.

Binet first used the picture method and tried to work out the mechanism of the personal influence of questions upon children. He began by addressing the children as follows:

"My friends, we are going to make an experiment, to discover if you have a good memory, a memory better than that of your comrades; I am going to show you a pasteboard which is here hidden behind that screen; on the pasteboard certain objects will be seen. I shall show you them for twelve seconds; twelve seconds, look at them attentively. It is a very short time, it is not a minute; a minute consists of sixty seconds; twelve seconds will pass by very quickly. It is thus necessary not to lose this precious time; make use of it in your observation of the objects very carefully, for as soon as twelve seconds elapse, I shall take the pasteboard away from you, and then I shall put a number of questions upon what you have seen. Many of the questions are upon the small details, and you are requested to answer exactly. Do you understand? Is it clear to you?" With this explanation, which, Binet says, has almost always had the effect to excite the curiosity and enthusiasm of the child, he showed the following six objects pasted on a card: a penny, a button, a stamp, a label, a photograph and a picture. The number of observers was twenty-five, all of the primary school, ranging in age from nine to twelve years.

Here the object was to provoke, in the observers, errors of the forced memory, and to discover the amount of error through imagination. Hence instead of asking their spontaneous description of each object, he first asked simply an enumeration of the objects and then put a series of questions, forty-one in all. The results were very poor compared with those obtained by other investigators, because of the very brief time of exposure. The percentage of the right and the false answers was 58.2 and 41.8 respectively. (6. pp. 262-269.)

Then the method of spontaneous narrative was tried, repeating the same test upon a different group of children without asking any questions, that is, the children simply wrote what they saw and remembered, the only recommendation being not to be contented with naming the objects, but to describe all the details. The number of the pupils tested was twelve, all of the upper class of the primary school, with the same conditions as far as possible. The results were: two pupils committed no error; two committed one error; one committed two; four, three; and three, four errors; while in the experiment of the forced memory, the minimum of error was five and the maximum was thirteen. (6. pp. 262-269.)

It is extremely probable that, if one forces the memory by suggestion, one may provoke a great number of errors. Thus Binet made three more tests by the use of the written questions. The same objects were shown as before. A number of children of ages nine to twelve were divided into three groups and each group received a different set of the questions. The first was intended to force memory, *e. g.*, "How is the button fixed?" The second was intended to produce a moderate suggestion, *e. g.*, the form of the questions was suggestive of false affirmation, for example: "Isn't the button fastened with thread?" The third gave a strong suggestion, *e. g.*, "What is the color of the thread which passes through the holes of the button and fixes it to the card?"

As Binet expected, the majority of his observers accepted suggestions and answered as if the memory images had been true and spontaneous as is seen from the following table. (6. p. 313.)

Questionnaire		Questionnaire		Questionnaire	
I		II		III	
5 children		11 children		11 children	
r	f	r	f	r	f
8.1	2.9	8.09	4.9	5.09	7.9
73.6%	26.4%	63.3%	37.7%	39.2%	60.8%

In this and the following tables,
r equals number of items rightly reported;
f " " " falsely "
u " " " uncertain "

The surprisingly high percentage of the errors in case of the third questionnaire shows how few of the children have sufficient independence of thinking and will-power to acknowledge and refuse the false suggestions. Twelve normal school students made the same kind of errors as the children did, though not so gross. (6. pp. 325-329.)

Binet concludes as follows: A full and concise report may be made and yet be false. (6. p. 285.) The experiment of the forced memory is subjected to error more than that of the spontaneous memory (6. p. 294). The method of suggestion by the written questions is powerful enough to influence not only children under twelve, but also young people of eighteen years of age (6. p. 329), and more so with the oral questioning. Hence if you desire a faithful testimony from a child, you must not ask him any question, nor command him to make an oral report, but require him to write spontaneously what he knows, since children are, even at the age of twelve, still incapable of distinguishing between fact and fiction or invention by imagination and reasoning. "How many adults are not grown up children in this respect!" adds Seashore in his review of Binet's *"La Suggestibilité."*

Following Binet, Stern performed several experiments on the same problem. One of them was carried out in the year 1902 with forty-seven observers of from seven to nineteen years of age of both sexes. After an introductory statement, almost the same as Binet's, Stern hands a picture, well known now as the *Bauernstube* (peasant room) to the observer to look at it attentively in bright day light for one minute, after which period he takes the picture away and asks the observer to describe what he has seen. If the observer begins to hesitate in his explanation, the experimenter says quietly: "Think of it; something may probably come to you yet." If the observer is again silent, the experimenter asks: "Does nothing occur to your mind any more?" Upon the answer: "no," the experimenter goes on: "Now I shall ask you a little more, and certainly something will come to your mind. But if you do not know any answer to the given questions, just say: 'I do not know.' It will not harm you at all, even if you do not know." Stern allowed one minute for observation in order that a thorough comprehension and better recollection might be obtained. The resistance to falsification through suggestion was thus increased. Twelve suggestive questions were mixed with the indifferent questions to divert suspicion, and the suggestive questions were, like the second questionnaire of Binet, purely "questions" that suggested the answer "yes." Each question including the suggestive one was asked only once in the most indifferent tone, and answered orally. The results are shown in the following table. (58. pp. 295-321.)

	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Bericht.............	24	1.5		% 94	% 6
Verhör.............	35	17.1	6.7	67	33
Normal q...........	in % 66	in % 26	in % 8	72.7	27.3
Sugg. q............	59	25	16	70.7	29.3

Thus Stern concludes that errorless testimony is not the rule but the exception; that the *Bericht* is far more trustworthy than the *Verhör;* that every question has a suggestive influence; etc.

Ranschburg (48), with thirty feeble-minded children of ages from eleven to seventeen; Rodenwaldt (50), with fifty soldiers of from nineteen to twenty-three years of age; and Revesz (49), with twenty-six morally depraved pupils ranging in age from nine to fifteen, made experiments after the same method and with the same picture Stern used; Oppenheim (45), with thirty girls of from ten to twelve years of age, in 1904, with three pictures named *Bauernstube, Feld,* and *Wasser,* after Stern's method, and Breukink (11), with 108 adult observers repeating the experiment of Oppenheim,—obtained similar results. In the experiments of Oppenheim questions and answers were given orally, while with Breukink they were in written form. The former experimenter, from the second test on, encouraged her observers to do better work, telling them that many false answers had been given. This, undoubtedly, warned the observers against the influence of the questions, especially against the suggestive ones, so that a better result was obtained in the later than in the earlier experiments. The educability of children in the giving of testimony is clearly observed in both cases.

Wreschner (70), dissatisfied with the method of Stern in regard to the *Bericht,* used his own method, the so-called examination-method (*Prüfungs-methode*). According to his explanation, its chief characteristic is that exactly specialised themes for testimony are given to the observers; it has the advantage of making conditions similar for all observers, and obtains an equal number of statements (*Angaben*) from all observers, so that the number of the statements, omissions and errors can be exactly calculable, etc. He notes that this method is closely connected with the *Verhör,* but he seems rather to ignore or at least to disregard its suggestive influence, as well as that of the usual interrogatory method. He used a picture called "*Grossvater*" with nine observers. A spontaneous report was given immediately after an observation of one minute; the second was given after seven days; and the so-called examination-method was used after seven days for four observers and also after seventeen days for the other five observers (70. p. 174). The results by this method also were similar (70. pp. 174-5).

Thus it is seen that the examination method like the *Verhör* raises many statements from latency into actuality, but, at the same time, it produces many errors, undoubtedly due to suggestive influence caused by narrowing the conscious field.

Borst (9 and 10) who followed partly Wreschner's method so that there were supposedly no suggestive questions in her experiments, though there were in reality such; Cohn and Gent (17), with and without distraction of attention during the observation of the pictures; and Dieffenbach (16) with ninety-eight observers of ages from seven to twenty, obtained results similar to those already given.

We now turn from the experimental results by the picture method to those of the objective method (*Wirklichkeitsmethode*) and cite a few of the results. In the winter of 1903 and 1904 an experiment was made by Stern (61) on the students in his psychological seminary at the University. The procedure was as follows: A gentleman steps into the seminary, wishes to talk with the lecturer (Stern), hands the latter, with a few words, a package of manuscript, asks the latter's permission to make use of the library in the seminary-room, takes up a book, goes out after five minutes taking the book with him and is asked by the lecturer (Stern) to wait outside for the latter until the close of the seminary." The number of the observers were fifteen, six women teachers and nine students. After eight days the *Bericht* and *Verhör* took place in writing. The result (61. pp. 17-22) was: With the *Bericht* the true statements amounted to 75% and the false statements to 25%; with the *Verhör* 50.5% and 49.5% respectively.

So, too, in the summer of 1904, Lisst (36) with twenty-two students, and Rohde (51) in 1907 with neuropathological but mentally sound patients, arrived at conclusions similar to those of Stern.

Suggestibility has hitherto almost always been investigated by introducing suggestive questions among the normal questions and by a comparison between results obtained through the normal and suggestive questions. This method is not entirely trustworthy, since the suggestive questions may refer to different objects, and the different objects are not retained in memory with equal clearness. (35. pp. 418 ff.)

This criticism may be avoided, if one investigates the memory for one and the same object by differently formulated questions. But naturally these different questions can not be addressed to one and the same person, hence one must put them to different persons as follows: The questions about an object (1): to the person (A) in the form (a), namely without suggestion, to the person (B) in the form (b) or with simple suggestion, and to the (C) in the form (c) of strong suggestion. This way Binet (6. pp. 296 ff) proceeded. But it may be objected that different persons are asked different questions. This objection can, however, be avoided, if one asks further questions about the object (II): to the person (A) in the form (b), to (B) in the form of (c) and to (C) in the form of (a); and further about the object (III): to (A) in the form of (c), to (B) in (a) and to (C) in the form (b).

With this in view, Lipmann and Wendriner (35. pp. 418 ff), in the year 1904, made an experiment on twelve children of ages from four to six, using the picture called the '*Bauernstube.*' The questions were of three kinds, namely, group (a) was without suggestion, group (b) of an expectant nature, and group (c) contained strong suggestion and was composed of hypothetical and incomplete disjunctive questions. Each child was asked three questions of each group. The results were with group (a), the right statements amounted to 94% and the false to 6%; with group (b) 75% and 25% respectively and with the group (c) they were 44% and 56% respectively. Because of the testimony by too small children, we can not draw any ultimate inference from such results, but still we can see a general relation among these different questions. Lipmann (33) later made an extensive experiment which gave the writer much valuable material which will be referred to later.

There are two more important investigations on questioning, one by Franken (22) in 1911 and the other by Bader in 1912. Franken considered the report not only as a product of the intellect, but also of will. With this in view, he tried to test the educability of the power to report in children, that is, whether children can be taught to be more careful in stating that they do or do not know this or that thing. His subjects were 150 pupils from eleven to thirteen years. He arranged 200 questions relating to data in history, geography, etc. into two series: one as decisive and the other as determining questions. The first 100 questions begin with the words: "Do you know" so as to be answered merely by "yes" or "no;" for example, "Do you know on what river Lyons is situated?" The second hundred questions are so formed that a specific answer is to be given directly, for instance, "On what river is Lyons situated?" Among other results he found that by this means the pupils can be made more cautious in their answering, though the false answers can not be fully eliminated. Some of the other results will be referred to later on.

Bader's experiment (3) was to investigate the influence of the question, on reaction-time, the quality and quantity of an answer, etc. He used the following nine different forms of questions or rather stimulus words for reactions. (3. pp. 3-4.)

1. What is the activity of the person designated by the stimulus word? Stimulus word: "soldier"—answer: "Marching."

2. What idea stands in a customary relation with the number given as a stimulus word? Stimulus word: "Seven"—answer: "Week." And so on. His results are very interesting and agree with the writer's view formulated before reading his article.

To sum up, the chief points of the results obtained by all these experimenters in regard to testimony and questioning are:

1. The errorless report is more frequent in the *Bericht* than in the *Verhör,* though it is the exception and not the rule.
2. The false statements of the *Bericht* are from one-half to one-sixth of those of the *Verhör.*
3. The range of the *Verhör* is far greater than that of the *Bericht,* but at the same time it is accompanied by an increase of errors:
4. Hence the *Bericht* is far more trustworthy than the *Verhör.*
5. The report given in reply to normal questions is generally far more trustworthy than that to suggestive questions.
6. The ability to report is educable to a certain extent by practice, warning, or correlation.

It should, however, be noted that the results above enumerated are merely the average of greatly diversified individual reports, and hence show neither any standard nor any rule for individual ability.

The Writer's Experiments

As a result of their experiments, Binet, Stern and others concluded that a spontaneous report should be asked first and then an interrogatory be given as a supplement to the former, since if questions are asked without a *Bericht,* there is great danger of falsification of memory induced by the questions which may not be eliminated later on by any means. This is certainly true, but none of these authors have shown how far this is true.

1. They demanded the *Bericht* first and then the *Verhör,* and failed to find out what influence the *Bericht* has on what has been given in the *Verhör,* that is, what would be the result, if the *Verhör* were given first and the *Bericht* followed.

2. Their questions were on points not reported in the *Bericht,* that is, the questions were not on every point concerning the facts under consideration but only on the omitted ones. Although Miss Borst did this, she as well as others ignored or rather failed to find what influence the succeeding *Verhör* had upon what had been reported in the *Bericht.*

These two points are very important for the formulation of any rule in regard to the order or place of the *Bericht* and the *Verhör* in the report as a whole.

With these points in view, experiments were undertaken to determine whether or not the results obtained by the other investigators are applicable in any way to the subject matter in our school curricula.

Only the following points are considered in this paper.

1. What is the relation: (1) between the *Bericht* given first and the *Verhör* following; (2) between the *Verhör* first and the *Bericht* succeeding.

2. What is the relation between normal and suggestive questions?

3. What is the relation between questions suggesting the right answer and questions suggesting the wrong answer? Here by suggestive questions we mean the so-called expectant as well as the 'yes or no' questions.

METHOD OF EXPERIMENT

As our interest is in practical application, we selected our materials from Frye's Grammar School Geography and Adam's Commercial Geography; the section on the Surface of South America and the section on the Guianas. (See appendix.) The experiments were carried out at two different times, one, at Dix Street School, in February and the other at Edgeworth Street School, in April, 1913, at Worcester, Mass. Both were partly conducted by the teachers of each class and partly by the writer personally, but always under the writer's guidance.

In the first experiment the number of pupils was ninety, twenty-one from grade 7-1, twenty-seven from 7-2, twenty-six from 8-1, and sixteen from 8-2; but three of grade 7-2 and one of grade 7-1 are not included in our numerical calculation, as they did not finish their work in time. In the second experiment, forty-four pupils took part: eleven from grade 7-1, ten from grade 7-2, thirteen from grade 8-1 and ten from grade 8-2. Both of 8-2 were given the section on the Guianas as subject-matter which they reviewed silently for ten minutes before the *Bericht* and the *Verhör* were required; the rest of the pupils were given the section on the Surface of South America which they reviewed about six to seven minutes before the *Verhör* or the *Bericht* was required. The time for the *Bericht* was about fifteen minutes and that for the *Verhör* about twenty minutes. The pupils of both grade 7-1, and those of grades 7-2, 8-1, and 8-2 in the second experiment answered the *Verhör* first and then gave the *Bericht;* and those of 7-2, 8-1 and 8-2 of the first experiment gave the *Bericht* first and then replied to the *Verhör*. In the experiment when the *Verhör* was given first, care was taken to erase the questions entirely from the blackboard before the *Bericht* was demanded, and also to make clear to the pupils that they should report again all that they knew on the subject in the *Verhör*.

The suggestive questions were formulated according to Lipmann's advice, that is, different forms of the suggestive questions were asked on the same subject-matter but to the different observers so that the suggestiveness of the questions might be compared. The pupils of grade 8-1 in the second experiment were not asked suggestive questions but the normal questions. During the experiment every precaution was taken not to give any suggestion whatever.

Numerical Calculation of Data

The following device for estimating our data was adopted, after various methods had been tried, as giving the fairest treatment:

A. In regard to the data on the Guianas.

1. A complete answer to each question was credited as one point.

2. An answer that gave one datum where a question demanded two data was counted as half a unit.

3. Answers to some of the questions (such as 11, 12, and 14. See Appendix.) were not demanded in full. If a pupil gave two names of the products or goods for exportation or importation, he was credited one point, if he gave only one name, he was credited half a point.

These regulations were followed in estimating the data in the corresponding *Bericht*.

B. As to the data regarding the Surface of South America.

1. A fact involved in each question was counted as one unit.

2. In the corresponding *Bericht,* the same rule was applied, but here a few exceptions were made.

a. If a pupil reported: "The vast forests in the Amazon river basin are called Selvas," he was awarded two points, since this report contained two facts corresponding to two questions in the *Verhör;* but if a pupil reported: "The vast forests in South America are called Selvas," he received only one point, as it gave only one fact.

b. If a pupil reported: "The Andes highland lies along the west coast of South America, he was credited with two points, though this answer, strictly speaking, is not complete, since it is important to know that the Andes is the primary or greatest highland.

c. If a pupil stated: "There are three plains called pampas, llanos, and selvas," he was credited one point, since some pupils thought that selvas meant a grassy plain in the south, while pampas meant a forest in the Amazon basin, etc.

As a whole these were the only difficulties, and so few in number that any alteration in the crediting caused but a small fraction of change in the percentage. The question naturally arises: Does not the pupil make any statements in the *Bericht* in addition to those contained in the sections employed for the experiment? To my surprise only five such statements intruded into the spontaneous reports: two pupils added "Plata river;" another two "Orinoco river" and one "Guiana highland." These five points were credited, if the statement was clear.

RESULTS

Our results are as a whole very similar to those obtained by the other investigators as the following tables show. That is, our results show that the *Verhör* gives far greater range of report in quantity, but much worse in quality than the *Bericht.* It is, however, to be noted here that while this is always true of the general average, it is by no means true of each individual. Five pupils made no errors in either the *Verhör* or the *Bericht.* Tabulating the reports of the normal questions, we have fourteen out of 130 pupils who obtained the full credit for every one of the questions. In both spontaneous reports it is rather surprising to find that ninety-five out of 130 pupils committed no errors.

RESULTS OF FIRST EXPERIMENT

	Grade 7–1					Grade 7–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Bericht.....	6.4	.14		97.7	2.3	5.8	.35		94.3	5.7
Verhör.....	18.3	4.1	1.6	81.6	18.4	18.3	4.2	1.5	81.3	18.7
Normal q...	12.4	2.4	1.2	83.8	16.2	12.5	2.3	1.2	84.4	15.6
Sugg. q....	5.9	1.76	.34	77.	23.	5.6	2.1	.3	72.7	27.3
	Grade 8–1					Grade 8–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Bericht.....	5.2	.35		93.7	6.3	5.8	.2		96.6	3.4
Verhör.....	17.9	5.	1.1	78.1	21.9	13.4	2.1	1.5	86.4	13.6
Normal q...	12.3	2.9	.8	81.	19.	8.5	1.1	1.4	88.5	11.5
Sugg. q....	5.6	2.15	.25	72.2	27.8	4.94	1.	.06	83.1	16.9

In the above table, with grade 7-1, and in the following table on the next page with all grades the *Verhör* was given first and then the *Bericht,* while with all the rest the *Bericht* was given first and the *Verhör* followed.

RESULTS OF SECOND EXPERIMENT

	Grade 7–1					Grade 7–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Verhör....	19.	4.1	.9	82.2	17.8	19.8	3.65	.55	84.4	15.6
Bericht....	7.7	.54		93.4	6.6	8.1	.6		93.1	6.9
Normal q..	13.18	2.36	.46	84.8	15.2	13.8	1.85	.35	88.1	11.9
Sugg. q....	6.2	1.5	.3	80.5	19.5	5.9	1.8	.3	76.6	23.4

	Grade 8–1					Grade 8–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Verhör....	18.3	4.1	1.6	81.7	18.3	13.05	3.1	1.85	80.8	19.2
Bericht....	6.	.4		93.7	6.3	5.1	.1		98.	2.
Normal q..						9.1	1.55	1.35	85.4	14.6
Sugg. q....						4.3	1.5	.2	74.1	25.9

I. *Relation between the Bericht given first and the succeeding Verhör.* A certain number of the statements given in the *Bericht* were altered rightly or wrongly in the succeeding *Verhör* as follows:

CORRECTIONS

Pupils	r to f	r to u	f to f	f to r	f to u
7–2 (7 pupils).......	7	3	3	2	
8–1 (11 pupils)......	16	4	3	4	
8–2 (6 pupils).......	3	6			2
Total..........	26	13	6	6	2

In other words, thirty-nine correct statements out of the total 402.5 given by the sixty-six pupils in their *Bericht* were changed wrongly in the succeeding *Verhör* by twenty-four pupils. For instance, in the *Bericht,* two pupils reported that the Andes highland lies along the western coast of South America, but in the *Verhör* they answered question 7, "the Brazilian highland." Another boy and girl reported that the Amazon river flows from the Andes highland and is the largest in the world, but they answered question 15, "from the Brazilian highland." Some pupils reported in the Bericht, "the coast of South America is not as irregular as that of North America," but they answered question 3, b, with "yes, it is as irregular as that of North America." Two girls of grade 8-2 reported that the British and Dutch planters plant coffee and cocoa in place of the sugar-cane because the price of cane-sugar has declined, but they failed to answer question 5. On the other hand, six of the total 18.5 false statements in the *Bericht* remained false in the *Verhör;* the other six of the 18.5 false statements were corrected by the questions in the *Verhör;* while the other two were changed to the answers: "I don't know." Thus we may justly infer that the *Verhör* is more likely to make the right statements of the *Bericht* false than to change the wrong statements to right ones.

The question naturally arises here: Why should questions as a whole have such an influence even upon what was given correctly in the *Bericht?* The reason which we shall discuss later on may be stated here briefly as follows: The pupils are now questioned after they have given what they thought true and correct, and this inquiry draws their attention to the idea so intensely that it rouses in their minds an element of doubt and causes them to become more suggestible.

II. *Relation between the Verhör given first and the Bericht following.* To determine this has never been undertaken by any of the investigators. It becomes thus one of the chief points of interest in our experiments. We said as a result of the experiments hitherto performed that the questions influence our memory so much that any distortion right or wrong may not be eradicated later. From this it might be supposed that after a given lesson had been studied for a certain period of time, if questions be asked that cover each fact, one should be able to give a far better report in the succeeding *Bericht* on the same subject-matter than if asked to give a *Bericht* immediately after the study and before the detailed questions. Indeed the questions preceding the *Bericht* analyze the whole subject matter clearly into points and connect them with the questions so that they serve as a sort of resumé and may thus facilitate the succeeding *Bericht.* And to a certain extent this hypothesis is true, but not so completely as might naturally be expected. If we compare the results from grades 7-1 and 7-2 in the first experiment, which are most justly comparable, because the pupils were taught by the same teacher under the same conditions, we see only a slight difference; again the results from grade 8-1 in the second experiment, where no suggestive questions were used, and 8-1 in the first experiment, and from 8-2 in both experiments show merely slight betterment, although 7-1 and 7-2 of the second experiment show rather better work than any other.

Furthermore, the *Bericht* that followed the *Verhör* revealed a most interesting phenomenon: nine correct statements out of the total 478 given in the *Bericht* by the pupils of grades 7-1, 7-2, 8-1 and 8-2, were not answered by them, when questioned in the preceding *Verhör;* forty-five correct statements of the 478 were the correction of what was stated falsely in the previous *Verhör;* sixteen false statements of the 478 were the remainders of what was already given falsely in the *Verhör;* and three false statements of the 478 were the falsification of what was given rightly in the *Verhör.* For example: one girl answered, "no, it does not," to question 16, b, but in the succeeding *Bericht* she said that the surface of South America resembles that of North America. One boy answered the question 22 (what are the vast forests in Brazil called? Answer, selvas), with "They are called pampas," but in the following *Bericht* said: "The vast forests of Brazil in the Amazon basin are called Selvas."

These facts show clearly: that the influence of the *Verhör* upon the succeeding *Bericht* is rather slight, that the mental activity of the children in the *Bericht* differs from that in the *Verhör* where they are made abnormal and passive, being compelled by the external influence of the questions, while in the *Bericht* they are self-dependent, being free from any external compulsion; or in other words, we may say that the mental attitude of the pupils towards the *Verhör* is different from that towards the *Bericht.*

In regard to the so-called sequence or place of the *Bericht* and the *Verhör,* we are made a little skeptical about the statement that the *Verhör* should be subordinate to the *Bericht* as a sort of supplement. It is certainly better to ask the *Bericht* first and then give the *Verhör* on those points not stated in the *Bericht* so that any distortion of what was given in the *Bericht* may be avoided in the *Verhör;* but if our inference is correct, that is, if mental activity in the *Bericht* has a peculiar tendency to correct what was given falsely in the *Verhör,* then is it not also useful to demand a second *Bericht* after the *Verhör?* In school practice, and even in the court where we do not know anything about the event, we may ask questions first and then demand the *Bericht* just as well as to give the *Bericht* first and then the *Verhör,* so long as there is no hypothetical, incomplete disjunctive and sequential question in the series of the given questions. The writer does not disregard the suggestive influence of questions by any means, but wishes to emphasize the significance of the mental attitude in the *Bericht.*

In order to avoid repetition, the rest of our results will be given in connection with the discussion of the other aspects of our problem.

DIFFERENCE OF PSYCHIC ACTIVITIES IN THE BERICHT AND THE VERHÖR

Why is the *Bericht* always more trustworthy than the *Verhör?* Why is the range of the *Bericht* always far smaller than that of the *Verhör?*

The psychic after-effects of the impressions received in the observation are of various degrees of intensity, vividness and clearness. The things observed with interest and attention are apt to be most firmly fixed and thus be kept most clear, while those perceived inattentively or unconsciously leave behind only insignificant traces or none at all. (58. p. 329.) Intense, vivid and clear images or ideas lie always nearest to the threshold of consciousness waiting, so to speak, for the imperative impulse for self-expression to shake off the yoke of inhibition. Such ideas take precedence in the *Bericht.* In addition to these, the observers with more or less effort raise above the threshold many ideas of somewhat vague potentiality which have lost their clearness and obtrusive character in comparison with those of the first group, although still possessing sufficient persistence to come within the sphere of voluntary recollection (58). Hence the *Bericht* is not passive, but active in the highest degree. It is a more or less powerful and independent conscious selection of the most vivid and clear ideas in memory to which is attached the feeling of the greatest certainty and, above all, of spontaneity. Because of this will-activity with a feeling of spontaneity, any vague ambiguous and uncertain ideas are rejected. Consequently the *Bericht* is good in quality though unfortunately its range is small. This psychic activity in the *Bericht* can be further verified by the results of experimentation. Rodenwaldt gave his observers an opportunity to look at the picture again in order that their self-correction might be made in both the *Bericht* and the *Verhör.* This showed that the correction of the *Bericht* was so small, as to amount only to one-seventh of the total false statements in the *Bericht*, while two-fifths of the false statements in the *Verhör* were corrected. This clearly shows that the confidence in the *Bericht* was so great that there was no thought of correction. (58. pp. 325-326.)

It is quite different with the *Verhör*. The activity here is passive or reactive in a sense of being constrained from without,—though it is quite necessary and helpful for recall of what the spontaneous report fails to give. The effect of a question or theme for recollection is twofold (24): it offers a key to open the store-house of the latent ideas which otherwise may remain continuously submerged, or it may draw the observer's attention to a gap in his knowledge so that he attempts to fill it with an answer of some sort. And this is done quite often from an irresistible impulse, since every question, even the most indifferent, the most cautious and the most unsuggestive, as appears in the experiments, is more than a mere question. It is a command for a recollection and the production of a certain answer (58. p. 330). This double effect of a question in suggesting to an observer a true or false answer is clearly seen in all the results mentioned. So great is the wish to give a certain answer, that the critical power is weakened. Hence the increase in quantity and the deterioration in quality in the report. The psychological conditions of the false answers are very different and depend on many factors which will be discussed later.

Obviously there are disadvantages in both the *Bericht* and the *Verhör*. Testing the mental state of a child by either would be a defective method. As Stern (58) and Wreschner (70) state, the spontaneous report allows very great latitude in individual voluntary activity and this causes some observers to notice very few, and others very many details, thus making the comparison of the different observers a particularly difficult problem. Moreover, we can not state justly whether a failure in regard to a certain fact or point in the *Bericht* is due to a lack of retention or failure in the power of immediate recall. Hence neither the *Bericht* nor the *Verhör* taken separately give the real mental status of the observer. They must go hand in hand. We must remember what we have already shown that to neglect to train the power in the *Bericht*, and to rely on the *Verhör* alone is to make children passive and halting in their self-expression and independent mental activity.

The following examples taken from the answers given by our observers show the great individual variations among pupils. Some can do good work respectively in both the

Bericht and the *Verhör,* while most of the observers fail in the *Bericht,* not only when given before but also after the *Verhör,* in spite of the fact that they can do fairly good work in the *Verhör.* One boy who could answer in the following *Verhör* twenty-three questions correctly out of twenty-four, gave his *Bericht:*

"South America is mountainous in the northern, eastern and southern part it is lowlands in the central part and hilly in the western part. (12-year-old.)"

A fifteen-year-old boy gave this *Bericht,* but answered nineteen out of twenty-four questions in the *Verhör* following.

"South America has a narrow surface center a level plain on the north and south and a mountain highland on the east and west with an irregular coastline."

On the other hand, a fifteen-year-old boy answered only eight out of seventeen questions, though he had given the following excellent *Bericht.*

"The three Guianas (British, Dutch and French) are interested in the production of cane-sugar and its by-products, molasses and rum. Owing to the decline in the price of sugar-cane, the British planters have replaced it by coffee and cocoa. The British supply one half of the fuel and coal used, and the United States one fourth. A large amount of rubber is produced in the Guianas, and an important amount of gold. Most of the cultivation is done on a narrow strip of land near the coast, where most of the people live. Paramimbo is the important trade center at Dutch Guiana, and trade of French Guiana."

A thirteen-year-old girl had answered correctly twenty out of twenty-four questions, but gave a poor *Bericht* after the *Verhör,* viz.

"South America is very mountanous, it has a higher highland on the west and a lesser highland on the east and a great plain between."

A twelve-year-old boy had answered only fourteen out of twenty-four questions, but gave a fine *Bericht* after the *Verhör,* viz.

"South America resembles North America in shape, etc. The northern part is wide but tapers towards the south. There are great mountains on the west and smaller highland on the east. The Andes highland on the west is long and narrow; and higher than the rocky mountains of North America. The highland of Brazil on the eastern part is wide but not nearly as high as the Andes. There is a great plain between these two highlands called the central part. It is divided into three sections. The central part along the Amazon river is called selvas meaning forests. The northern part is called llanos meaning grassy plains, the southern part called pampas also means grassy plains."

The Nature of the Answer Depends on the Form of the Question

There are various forms of suggestive questions, though not always perceived as such. Stern says that hardly any ideal question is an entirely unsuggestive question. (58. p. 339.) Hence it is impossible to avoid suggestion in the *Verhör*. (64.) Against the above statement of Stern, Miss Borst (9. p. 78) argues as follows: "I can not agree with him. According to my opinion, there is suggestion only when we put to an observer a question which refers itself to an object which was not present in the picture or the like employed for the experiment, and by means of which a false idea will be smuggled into the observer's mind. All other questions, however, which refer themselves to a really presented thing, build only a support for recollection, and that is exactly what is aimed at by the *Verhör*." (9. p. 78.) Thus she means by a suggestive question one which gives a false suggestion, but, as we shall see later, we know that a question may suggest a right answer. Moreover, what does her phrase "a support for recollection" mean? Does it not mean a narrowing or limitation of our conscious activity, leading or inducing the observer to focus his attention on a certain idea or ideas? When the mind of the observer becomes more and more a blank as the result of voluntary inhibition of ideas or associations, he is more apt to yield to suggestion. This is because the power of suggestion often consists in the fact that the mind is centered on only one or two ideas; all distractions are carefully excluded, and much greater power is therefore manifested along the restricted line than when the mind is attending to many stimuli simultaneously or in rapid succession. Inhibition of all ideas but one greatly intensifies the one.

Along this special train of thought we are prone to be swept by suggestion. Does there not then in the function of support for recollection lie a suggestive influence which she seems to ignore? It is a matter of course that every question is not suggestion, but there is suggestion in every question. She further says: "One observer, for instance, forgot to name an apron in his enumeration of the articles of clothing, and I put to him the question, whether the child had on an apron or not? Here we have certainly nothing to do with a suggestive question, for there is no ground at all which to the observer would suggest a positive answer rather than a negative one." (9. p. 78.) But if the observer failed to notice the apron, as Breukink (11) found, he might get a suggestion from such a question. We can not, however, agree with Stern (64) when he says that it is absurd to ask, for instance, about the color of a hat, when the observer has not named it in his enumeration of articles of clothing. He maintains that by this question suggestion will be made; for when the observer omits the naming of the hat, it shows that he had no recollection of its existence. Miss Borst remarks, I do not understand this objection: "The investigations of memory teach us (and Stern himself has emphasized this) that it can not be said that a recollection has vanished from the memory. Even when it does not occur spontaneously; elements of recollection can remain latent in memory. The purpose of the *Verhör* is precisely to revive these elements of recollection from their latency." (9. p. 79.) All the other investigations as well as our own have shown that the observers have failed to mention certain things, yet answer questions in regard to them with certainty. It is a question whether or not such an answer is suggested or a real memory. Probably both factors co-operate in such a case. A question as a whole has not a suggestive influence when the memory is clear, vivid and strong, and accompanied by a feeling of certainty. On the contrary, every question is apt to be suggestive when the memory is vague, obscure and uncertain.

The suggestiveness of the questions may be graded artificially according to the logically-grammatical form of the questions.

Attention was drawn to this problem first by Binet (6. pp. 297 ff), but the more elaborate gradation was left to Stern (58. pp. 338-345) and later taken up by Lipmann. Stern grades the suggestiveness of the questions beginning with the least suggestive as follows: (1) The determining question (*Bestimmungsfrage*), or the question introduced with interrogative-pronoun or adverb: which, who, where, why, etc; (2) the complete disjunctive question or the "yes or no" question; (3) the incomplete disjunctive question or the "either-or" question; (4) the expectant (leading) question or the "yes" question or "no" question; (5) the hypothetical and (6) the sequential question (*Folgefrage*). Lipmann (33. pp. 58-60) used practically the same distinctions. Each of these forms of the questions has its own peculiar psychological significance or function. We shall follow the analysis of Stern.

The determining question offers a wide field of ideas within which an observer can exercise his own power of free choice. Hence he can be self-assertive in his answer; for instance: what is A? Describe B? has no limitation for the field of ideation about A or B. Such a question simply appeals to the memory without suggestion. Thus it is considered as the most indifferent and harmless question.

The complete disjunctive question, or the "yes or no" question, requires the observer to decide between the two ideas offered by the question, or between 'yes' and 'no,' one of which is always false. For example: Was that A or not? Here the idea A is presented to be selected or negated from the vast field of other ideas, and apparently there is no limitation for the answer. But when we introspect, we perceive the idea A clearly and distinctly with vague ideas coming and going in our conscious field, as its back-ground. Consequently the idea A has an affirmative, while the rest have a negative tone. The only chance is either to affirm or negate A. This limitation in the selection of the answer renders the suggestion more influential than the preceding question.

According to both Stern and Lipmann, the tendency to answer "yes" is stronger than that to answer "no," but Borst takes an opposite view. This may be due either to the special influence of her oral questioning or to difference of suggestibility of the observers, as it is found by Goddard (23. p. 4) that a certain type of child will always answer the last of two alternatives. Our experiment also shows that a certain child answers always with "yes," and another always with "no," no matter whether the question is a "yes or no" question or expectant question, but the tendency to answer "yes" is far stronger.

Lipmann says (33. p. 58) that the complete disjunctive question, for instance: It is A or B? is less suggestive than the "yes or no" question, *e. g.*, Is it A? This is to be contrary to the result of writer's own introspection. The form, "Is it A or B?" suggests dual or rival determination, presupposing belief in a sphere of existence in which either supposition or both may have confirmation according to the meaning. Though there is surely suspense as to which of the possible assertions is to be accepted, but the certainty of the issue to be A or B or both is expressed, and consequently the field of ideation is exhausted by A and B (15. p. 347). On the other hand, "yes or no" question, *e. g.*, "Is it A or not?" or "Is it A?" are of an indefinite alternative over against the definite alternation of the complete disjunctive question, because "it may be A," or it may be something else. Of course it may happen to be exclusive, if "it is A," but never exhaustive in its suggestive influence like the complete disjunctive question proper.

There are two kinds of "yes or no" question which are ignored by the great majority of questioners. A question, "Is it A?" is called a true "yes or no" question, when the answer A is true; and it is called a false "yes or no" question, if the answer A is false. The following table shows the difference of suggestiveness of each form of question for 117 pupils in our experiments.

	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
True yes-no-q.......	174	25	11	87.4	12.6
False yes-no-q......	119	85	8	58.3	41.7

Hence it appears that the true "yes or no" question produces far more right answers in every case than the false one, while the latter without exception produces more false answers than the former. Moreover seven of 117 pupils answered with "yes, so and so," and three with "no, so and so" to every "yes or no" question whether or not its content was true or false. From these results it appears that our school children are not only suggestible but also are mechanized to react to the form of the question instead of to its content.

The expectant question (leading question), is more suggestive than the former according to Stern and Lipmann, since the form of the question in itself represents the questioner's expectation and leads the observer to accept it unconsciously. Take, for example, a question: "Was it not A?" and analyze it into the two parts: "It was A" and "was it not?" The first part affirms that it was A, while the second shows a clearly expressed expectation. The mind has a tendency to accept as true anything that enters it. A belief is urged from the start by the words "was not." The suggested idea must, thus, dominate, even when the observer has a clear knowledge of it, as the possibility of doubt is covered by the probability of the expectation. The first given interpretation persists and is taken as true even without being consciously regarded as true or false. This is frequently true when his knowledge is vague, and his belief in the questioner is strong. The expectant question is, according to Lipmann and also in the opinion of the writer, weaker than the incomplete disjunctive question, for the former causes the observer to appeal to his memory, feeling of course the influence of the insinuation which results from the question, and in some cases the word 'not' serves as a warning, while it is not the same with the incomplete disjunctive question which offers two ideas, neither of which is true, presupposing that one of them is true.

Lipmann differentiates the expectant question as false and true according to its meaning. For example: Is it not A? is true if asked, when the answer A is right, and it is false, when the answer A is false. His result shows (33. pp. 69-70): "the false answers were diminished about 24% by the right expectant questions, and the right answers were diminished about 18% by the false expectant question in relation to the total statements. The right answers were increased about 12% by the true expectant question and the false answers about 2% by the false one, in relation to the total statements. In both cases the suggestive formulation caused an increase of the uncertain answers; with the true expectant question about 13%, and with the false about 17%. Thus he concludes that the true expectant question has a stronger influence than the false, and that the former brings out more right and fewer false answers than the latter. (33. pp. 54, 60, 61.)

Our experiments with 117 pupils confirm Lipmann's results. The expectant questions gave: $r = 137$, $f = 27$, $u = 1$, that is, the true statements amounted to 83.7% and the false ones to 16.3%, while with the false expectant questions, $r = 98$, $f = 55$, $u = 8$, that is, 64% and 36% for r and f respectively.

Furthermore twelve of 117 pupils in both experiments answered every expectant question, whether true or false, with "yes, it is so," and three with "no, so and so." Here again, the children are habituated to react to the form of questions, and not to their content. It is of a vital significance for a teacher to recognize this different function of the true and false questions, as each gives such a different result clearly shown by our table.

The incomplete disjunctive question is stronger in its suggestive influence than the preceding ones, since here neither of the answers can be right. As, in case of the complete disjunctive question, the possibility of an answer is not only logically exhausted, but the probability of a wrong answer is very great; for to answer independently of the two alternatives offered requires a mental self-reliance, of which most of us are not capable. This type of the question too can be divided into two forms: true and false, according to its content.

The hypothetical question is in its form exactly the same as that of the determining question, for instance: "what is the color of A?," and must be valuated unsuggestive from the stand-point of the form. But suppose that the observer until questioned did not know of the existence of A, what will be suggested? He will surely reason: The question asks now after the color of A, then there must have been A (58.

pp. 342-343). He will thus come to silently accept the intentional suggestion of the questioner. If A is once accepted, it is easy to attach attributes to it. Even when the observer does not or can not attach a color to A, if, for instance, he answers, "I do not know its color," he is still a victim of the suggestion, for he tacitly admits the existence of A in the form of his reply. The hypothetical question also can be divided into true and false forms according to its content. (33. p. 59.)

The sequential question makes use of an implication: One who says A, must also say B. (58. p. 343.) For instance: If a question, "was not A there?" (when in reality it was not there) is accepted by the observer, then this acceptance means that he will admit the existence of the color, size, etc., of the A, as it is natural to infer that the A should have been colored, etc. The sequential question is used when a hypothetical or the like question is accepted.

Thus we can make a graded series according to the degree of suggestiveness contained in the form and to some extent the content of the questions. However, the suggestive influence of each form of the above questions is not in its numerical percentage proportional to the scale. To answer a hypothetical and sequential question, a part or the whole of an object or a thing must be invented, and this invention needs a great mental effort, or a struggle against the present mental state. This is probably the reason why these questions result often in a small percentage of errors. Again that the effectiveness of the suggestive questions declines strongly with increasing age, while the frequency of the erroneous answers to the normal questions is fairly independent of age, shows that the nearer a question is to the normal, the less suggestive it is.

It is interesting to note that the observer passes through various stages of mental resistance against the suggestive influence of questions. According to Binet's observation, the first instance which follows the reading of the question is a moment of scepticism. This is shown by a murmur, "But I don't know," or by the gestures of ennui or negation, or mimic expressions, etc. Some translate this state of scepticism by the written answer, "no," which they finally efface; some say "no, it was not so." This state of an initial resistance persists indefinitely with some observers. (6. p. 303.) The second phase is that of half yielding to the suggestion. The observer commences to write his answer, but he is arrested by a decisive word or words. Finally, a third phase is that of the execution of the suggestion. Here the observer shows often, at the moment when he writes his answer, a flushing of the face, as if he had a sentiment of shame. On the other hand, there is sometimes a resistance which is first at a maximum and then terminates with a disbelief in suggestion. (6. p. 304.)

The same phenomena have been observed very distinctly by the writer in his own experiments. It is rather surprising to find that thirty-two cases of 117 pupils in both experiments erased their answers to the "yes or no" questions as well as to the expectant questions and corrected rightly or wrongly in the following ratio, that is, twenty-two cases rightly, and ten wrongly.

For example, some pupils answered, "Yes, it is as irregular as that of North America" to the question 3 (b) (Is the coast of South America as irregular as that of North America?), but erased this answer and wrote "No, it is not." Others wrote first, "Yes, it means level land," to the question 21 (b) (Does 'llanos' mean level land?), but corrected it to "no, it means highland," erasing the first answer. Besides these thirty-two cases of correction, there were four special cases where two pupils wrote "no" as an answer, but erased it, and then wrote "no" again, while the two others did the same with "yes."

A comparison of the suggestive influence of each form of the questions by means of the experimental results already obtained follows.

That the "yes or no" question is more suggestive than the determining question has been shown experimentally by Binet (6. p. 313), Chomjakov (14), Lipmann (33) and others. Our investigation with 13 pupils showed with the normal questions (3, 9, 16, 19, and 24 of 2nd series, appendix), true answers amounted to 71.9%; false ones to 21.9%, and uncertain ones to 6.2%; with the corresponding true "yes or no" questions with 42 pupils, 90.4%, 9.6% and zero % respectively; and with the corresponding false "yes or no" questions, 54.7%, 41.5%, and 3.8% respectively.

The results of Stern, Rodenwaldt, Oppenheim, and others show that the leading (expectant) is more suggestive than the determining question. But in all these cases, the leading as well as the normal questions were applied to the different objects, so that we may not be justified in depending upon their results. The results of Chomjakov and Lipmann can justly be relied upon, for they applied both kind of questions to the same objects, though as a matter of course using them on the different observers. Chomjakov (14) showed three groups of each fifty students a sheet of paper which was spotted with red and violet color. The first group was asked: "How many red and how many violet spots have you noticed?" The second was asked: "Have you not noticed red spots between the numerous violet ones here and there, and how many were there?" The third: "Have you not noticed between the numerous red spots here and there, also violet spots, and how many?" The results were: The first group answered on an average with eleven red and eight violet; the second with fifteen violet and four red; the third with four violet and fifteen red.

Our results agree to some extent with Lipmann's (33. pp. 53-4, 68-9). They show clearly that the true leading questions suggest the right answers more strongly than the false leading questions do the false answers when compared with the nonsuggestive questions corresponding to both.

We obtained in the experiments with the normal questions (8.13 and 21 of 2nd series, appendix) with 13 pupils: true answers = 71.8%, false = 20.5%, and uncertain = 7.7%; with the corresponding true expectant questions on the 42 pupils, r = 94%, f = 6%, and zero for u; with the corresponding false expectant questions, 66.7%, 20% and 13.3% respectively.

From all these experimental results, it is seen that the expectation aroused by means of the phrase, "Was it not," or words like "numerous," "truly," "perhaps," "honestly," etc., or some special instruction or silent manipulation—as in the experiments of Lobsien (38), Kosog (29, 30), Seashore (56. pp. 30-31), Scott (55), Plecher (47), and others,—produces a high percentage of suggestibility. And that the false leading questions do not act more suggestively than the false "yes-or-no" questions, provided that the former are differentiated from the latter only by the word "not," is determined by both Lipmann (33. p. 70) and Rodenwaldt (50). In our own experiments the false "yes-or-no" questions brought out more false answers than the false leading ones. This is perhaps due to the fact, as Rodenwaldt rightly states, that "the intelligent observers easily discover that they will be led into a trap by the word 'not'" and become cautious, while they more easily fall into a trap with the false "yes-or-no" questions where the word 'not' is omitted.

For the suggestive influence of the false hypothetical and the incomplete disjunctive questions the readers are referred to Lipmann's exact work (33. pp. 75 ff), Binet (6), Lobsien (38), and others.

In summarising, it may be said that the suggestiveness of a question to a great extent depends upon its form and its content; that a determining question is the least suggestive; that the true leading as well as the true "yes-or-no" questions are more suggestive than the false ones, the former evoking more right answers and the latter more false ones without exception.

Relation Between the Suggestiveness of a Question and a Questioner

It makes a great difference whether a question is presented to a pupil by his fellow-student or by a teacher; to a witness, by a disinterested person or by a judge. "The presence of persons," says McDougall (40. pp. 98 ff), "whom we regard as our inferiors in the particular situation of the moment evokes the impulse of self-assertion; towards such persons we are but little or not at all suggestible. But, in the presence of persons who make upon us an impression of power or of superiority of any kind, the impulse of submission is brought into play, and we are thrown into a submissive, receptive attitude towards them." "The personality or impressive character," says Keatinge (26. ch. 5), "can set up in another a state of emotion sufficient to produce an unstable and easily dissociated condition of mind, and thus to inhibit the rise of the development of contrariant systems." Such an authoritative influence is apt to modify the nature of an answer.

Thus under the influence of an authority or of masterfulness in the questioner, an observer may come to such a logical conclusion as follows: "Why, what else can I think of? The desired answer must surely be right! The questioner should know it; why, I thought it was this, but he asks about that, am I then mistaken, or is he? No, he should not be so, then I must be." Consequently, if a question is a "yes-question" or a "no-question," he will answer "yes" or "no" without further reflection. If a question is a "yes or no" question, he will react to it with "yes," irrespective of the content of the question, even where according to his knowledge, the answer should be negative. Some pupils, as we have seen, are mechanized to answer "no" to every "yes or no" question, whether its content is true or false, while the majority are habituated to "yes." If, however, a question is an incomplete disjunctive or a false hypothetical question, one will decide in favor of the most probable answer (33. p. 214).

Next to authority, the facial expression of a questioner has a great influence not only for provoking or inhibiting an answer, but also for determining its nature. The following examples are illustrative (68. pp. 84-85):

> Counsel (taking up the two lower bones of the leg attached and approaching the witness.) "Will you please take these, doctor, and tell the jury whether in life they constituted the bones of a woman's leg or a man's leg?"
>
> Doctor. "It is difficult to tell, sir."
>
> Counsel. "What, can't you tell the skeleton of a woman's leg from a man's, doctor?"
>
> Doctor. "Oh, yes, I should say it was a woman's leg."
>
> Counsel (smiling and looking pleased). "So in your opinion, doctor, this was a woman's leg?" (It was a woman's leg.)
>
> Doctor (observing counsel's face and thinking he had made a mistake). "Oh, I beg your pardon, it is a man's leg, of course. I had not examined it carefully.'
>
> Counsel (still smiling). "Would you be good enough to tell the jury if it is the right leg or the left leg?"
>
> Doctor (quietly and hesitatingly). "This is the right leg."
>
> Counsel (astonished). "*What* do you say, doctor?"
>
> Doctor (much confused). "Pardon me, it is the *left* leg."

Here it is clear that this doctor's answer was modified wrongly by the counsel's facial expression, which was interpreted by him as a sign that his answer was wrong. So, too, children's answers in the school-room are often modified by their teacher's facial expression. We cite a few examples from the returns to a questionnaire used not for the purpose of studying questioning but for the study of imitation and suggestion.

> "The teacher in history may ask you a question and generally one that has to be explained. It might take three or four minutes to answer. All the time her face seems to be a perfect blank. She does not look at the person reciting or answering but directs her gaze in another direction. Sometimes I stop and wonder if I am saying the correct thing and then finish the recitation or answer in its midst. If she would only attend to our answers and recitation, we would have much more confidence in our work and do it better."

The slightest inclination of the head, the dropping of the eyelids, or a certain expression of the face are apt to be read by the shrewd pupil as a sign of the truth or error of his answer, so that he may continue or stop his recitation. (4. pp. 76-77.) It is better not to give any sign whatever while a pupil is answering, except for an encouragement when a pupil is timid or hesitates to express himself.

To help a child by such signs makes him passive, leads him to depend upon the teacher instead of relying upon his own knowledge. It fosters guessing or leads a bright but unprepared pupil to steer through a recitation guided by the unsuspecting teacher. This will be more clearly understood through the following examples:

"I know," says a Normal School girl, "some teachers who ask a question in such a manner and tone that it is easy to know whether the correct answer is 'yes' or 'no.' Then I have known of another case where by the teacher's facial expressions, gestures, etc., you could tell, if you had only recited the first part of the answer, that it was wrong or right." (Twenty-one cases.)

Another girl says: "I have always been greatly aided in my recitations by carefully watching a teacher's face. In most instances I can tell whether or not I am 'on the right track.' There is something about their facial expression (very slight indeed) that helps me to 'feel my way,' so to speak. This means, of course, was used more during my grammar and high school years."

As the facial expression, so the tone of a teacher's voice affects the answers of children. In our school rooms we frequently notice that the pupils often decline or fail to answer the questions asked, and generally it is inferred that they do not know. But such an interpretation is very often incorrect. For instance, a girl of twelve says: "I knew very well the answer, but the teacher's tone of questioning suggested to me that she does not care much about the answer. So I felt that my answer was not important and consequently I did not answer." (9 cases.)

Two girls of the seventh grade say: "If a teacher shows that it is fun for her to ask a question, we become stubborn and simply refuse to answer."

Still another girl says: "If her tone indicates that she is cross, I don't feel free to talk during her lesson or to answer her questions; it also discourages me and makes me not to enjoy the subject. As a result I often remain silent waiting impatiently for the period to end."

"Our teacher's voice was so sharp and cross that whenever she called my name, I became very nervous and could not answer her questions even when I knew them well." (Thirty-one cases.)

On the other hand, a teacher who teaches out of the fulness of her heart will stimulate more responses in the children's minds and hearts.

Again when a questioner puts a special emphasis on a certain word or uses either rising or falling inflection in her questioning, the corresponding answer may be of little value. An observer takes a suggestion from the word that seemed most emphasized and reacts to it with the very word. Such a reaction is most likely to take place when a "yes or no" question or a "leading question" is asked with a certain inflection of tone.

Closely related to the above factors is a questioner's expectant attitude towards an observer. "As well known," says Krebs, "if everybody, especially those to whom we look up expect us to fail, it requires the puissance of a psychological giant to withstand this killing psychic atmosphere. . . . If, however, they expect us to do our best, that very cooperative expectation inspires and infires us to do it, and we succeed." (31. pp. 53-54.) So, too, the expectation of a teacher causes the weak-minded, the discouraged, the nervous, and the like to form the same opinion of themselves. Thought tends to realize itself in actuality; they become what they think. This is why some children are made nervous or confused and often fail to answer a question or to recite, when asked with words like these: "John, can you answer, I don't think you can, but try it; Mary, I doubt if you can. . . . and so on."

A seventeen-year-old girl reports: "In another class I am almost afraid to say anything, because the teacher impresses me as having the attitude that she is sure I am going to make a mistake, and that she is very much surprised if my statement is correct. In one or two instances, I have known this teacher to stop a pupil in the midst of a statement, saying that it was wrong; while if she had let the pupil finish it would have been correct." (Five cases.)

Another factor that has an important effect on the nature and the possibility of an answer is a sympathetic or nonsympathetic attitude. Sympathy is an indispensable quality for normal suggestibility. As in water, face answereth face, so in man, the heart to heart. The following examples are illustrative:

"The plaintiff, a laboring man, had been thrown to the street pavement from the platform of a car . . ., and had dislocated his shoulder. He had testified . . . that . . . he had not been able to follow his usual employment for the reason that he could not raise his arm above a point parallel with his shoulder. Upon cross-examination the attorney for the railroad asked the witness a few sympathetic questions about his sufferings, and upon getting on a friendly basis with him asked him 'to be good enough to show the jury the extreme limit to which he could raise his arm since the accident.' The plaintiff slowly and with considerable difficulty raised his arm to the parallel of his shoulder. 'Now, using the same arm, show the jury how high you could get it up before the accident,' quietly continued the attorney; whereupon the witness extended his arm to its full height above his head, amid peals of laughter from the court and jury." (68. pp. 47-48.)

Such a drama is played by our school children more or less in response to a teacher's sympathy towards them. The effect of any unsympathetic attitude appears in various ways as follows:

A girl says: "One teacher I had was never sympathetic toward me. She was always finding fault with my recitation and answer unless I recited the lesson in her words. Thus I failed to answer even the easiest question." (Eight cases.)

Another girl says: "A fault-finding attitude of our teacher amuses me so much that I look indifferent and hit less in my answering in order to excite her." (Three cases.)

RELATION BETWEEN QUESTIONS AND THE PERSON QUESTIONED

All experimental results show that a suggestive question succeeds in one case, but fails in another. It never succeeds uniformly. Again some persons are so suggestible that they are influenced, even by nonsuggestive questions (57. p. 132); others can resist even the strongest suggestion involved in a question. The suggestiveness of a question thus depends primarily upon the suggestibility of the person questioned, and this is not constant, being dependent on many internal as well as external factors.

First of all, the mental content of the person questioned is responsible for the suggestiveness of a question. The potential starting point of an individual reaction is an object or a fact, ideal or perceptual; and every object, or idea, possesses for an individual mind a stimulative or a suggestive influence. The individual conscious state at the moment interprets a stimulus, accepting or rejecting it. Hence, if the content of the mind in question is poor, ill organized and unsystematized, the mind is apt to be a victim of an external as well as an internal stimulus. This is the reason why many experimenters hold that the less intelligent an observer is, the more suggestible he is, and that children are, in general, more suggestible than adults. Even with people of higher intelligence, deficiency of knowledge relating to the given topic heightens the suggestibility of the person questioned.

In the case of a child, a similar suggestibility occurs whenever there is little or no direct conflict with his experience. A child believes in any commanding idea, in a pleasurable or wished-for thing as well as a dreadful or not-wished-for thing. This subjectively conditioned belief, auto-suggestion or credulity supposes always a grade of dissociation, from which no child can be absolutely free. If this dissociation increases, the object of each agreeable idea can be finally believed and appears as real. (37. p. 246.) Belief is an original and a natural process in the mind of a child. He does not doubt any thing that he learns until he has accummulated a considerable amount of knowledge, and attained a relatively high stage in the development of intelligence. Moreover "to doubt is usually unpleasant and may arouse complicated strain sensations to add a new element to the unpleasantness" (46. p. 34).

Consequently, even when a child's knowledge is comparatively accurate, when he is under the sway of an authoritative impression or his own auto-suggestion, he may answer as suggested, thinking that perhaps that is called 'A,' which used to be called ' B.' Such a reaction may not take place so easily if a question is asked by a fellow-student or an inferior person, but it is apt to happen under the influence of authority. When a person is influenced by a suggestion he loses his critical or analytical power towards the form and content of a question and simply attends to or searches in his memory for corresponding ideas, and finally produces his answer as if it was a spontaneous report. Whenever credulity and authority go together, the result is doubtful. Lack of will, too great credulity, and too little self-criticism are great obstacles to independent, self-assertive reaction (62. p. 272).

Another group of persons yield to a suggestion even against their own knowledge, because of their affection or because ambition is aroused towards a questioner. An observer really knows that to answer ' A ' or not to answer at all is contradictory to his own knowledge, but he does not venture to resist the question asked; for he does not like to make himself disliked, or he fears punishment or some kind of annoyance. (33. p. 216.) Thus under certain circumstances, some observers conclude not to contradict directly, but also not to come in conflict with their own knowledge, and hence take an attitude of a compromise. (33. p. 231.) These affective reactions perhaps decrease with growing mental development and education. If this affection becomes stronger the suggestibility of an observer in general increases. "Whatever weakens the reason," says Cooley, "and thus destroys the breadth and symmetry of consciousness, produces some form of suggestibility. . . ." (18. p. 40.) So, too, Bleuler says that the suggestibility grows proportionately with the strength of an existent affection (7. p. 54), so that we find memory illusions even in the normal individual as soon as affection comes into play (7. p. 69). He continues: "Both suggestibility and affection render criticism difficult or check it even completely." (7. p. 69.) If an observer comes under such an influence, he becomes the unresisting instrument of a questioner. (58. p. 333.) He gives an answer to a question, but does not examine whether it is right or not; he simply contents himself with a vague feeling that it may be correct; he estimates the authority of the examiner higher than that of his memory.

Similarly the ambition of an observer changes the quality and quantity of an answer to some extent. Franken (22. pp. 214 ff), Kosog (29. pp. 71-72) and others have shown that the ambition of an observer increases with the range of his knowledge, increasing the extent of an answer but reducing its qualitative value. The reason seems to be that with ambition the power of caution or criticism is checked and the childish imagination is intensified (29. pp. 71-72).

Closely connected with this group of reactions is a type of reaction traceable to the so-called counter or contrary suggestibility. This is a tendency to react, immediately, uncritically or critically, but always negatively, to the suggestion made. (39. pp. 372-374.) If such observers notice that a definite answer is suggested by a question, then they form the opinion that this answer will probably be false.

There is an acute type of this contrary-suggestibility which may be termed an inborn contrary-suggestibility. Here the mode of reaction approaches almost the negativism described by Kraepelin as "the instinctive resistance against every outer influence upon the will" (8. p. 10). As soon as such an one gets suggestion, he feels antagonistic; no idea suggested gives him any satisfaction and so he chooses something else, and the "something else" is apt to be the opposite, since "each idea suggests, as it were, a contrary idea as its natural complement" (8. p. 32).

However this tendency in children is not rebellion or conscious assertion of the self against an opposing will. "It represents rather that stage in the normal process of self-development in which the crude materials of rational action have been given, but in which successful co-ordination has not yet become possible" (39. p. 379). "But to have become the characteristic form of reaction in an adult is an indication of arrested development, since in proportion as this type of action predominates, the mind becomes blinded to the very basis of rational conduct. It must be utilized . . . . . to establish that habit of reflecting upon reasons for and against any suggested course of conduct" (39. p. 380).

Besides those above mentioned, there are still at least two types of reaction due to exercise or repetition. A question draws the attention of the observer to a given problem and gives rise to an idea of purpose (*Aufgabe*) to solve it. This idea of purpose conditions a certain mental state which may be called "Attitude or a definite reaction mood" (*Einstellung*) (33. p. 77). This attitude or mood, after several repetitions of reactions to the same stimulus in a definite way, is apt to develop into the purely mechanical or expectant mode of reaction.

The purely mechanical reaction or habit is found to play a great rôle in the well known abnormal or supernormal suggestibility of soldiers (50. p. 315), policemen, children and others, under strict discipline. Here the suggestibility is undoubtedly fostered by exercise. So, too, some observers are found very often to acquire the habit of either a motor or vocal reaction, to a similar stimulus. If children are habituated to react with an answer "yes" to a "yes or no" question, they will be mechanized to this mood of reaction, and will answer without reflection but merely automatically, even when the content of a question is entirely changed from true to false.

To discover how an expectant attitude affects even normal questions, Lipmann (33. pp. 78-81) made another experiment which showed that the increase of error is greater in an experiment with a leading question as the first of a list of questions than in a series without such a question, which produces an expectant attitude towards the rest. Again an expectant attitude may affect suggestive questions in a peculiar way. For instance, after an observer has answered a number of normal questions in succession, he is apt to fall into the trap of a suitably formulated suggestive question, or questions where their suggestive character is not apparent (33. p. 77). In all these experiments it is hard to say how much of the results is to be ascribed to suggestive questions, and how much to an expectant attitude, but we may safely say that the expectant attitude has played an important rôle, since its function is to dull the critical power, which Rodenwaldt (50. p. 316) found stands in inverse ratio to suggestibility. There are cases, however, as in Seashore's experiments, where even the greatest caution will not ensure protection against skillful suggestion (56. p. 43).

Children's suggestibility may be due also to their lack of attention, defective observation, lack of language, etc., or all these factors combined. It is thus difficult to say that a particular result is caused by a definite influence. It is a teacher's function to investigate the suggestibility of each pupil and to make practical use of such knowledge.

QUESTIONS FROM THE PEDAGOGICAL POINT OF VIEW

Questions, as employed by teachers, may be divided according to their purpose.

1. The preliminary or experimental question aims to find out what the pupil knows. The teacher, by means of this class of questions, is able to arouse a pupil's curiosity and intellectual activity (21. pp. 76, 81).

2. The questions employed in actual instruction, by means of which the reasoning power of a learner is exercised are analytical or developmental. The purpose of the analytical question is to analyze knowledge into its elements in order to bring its implications to consciousness (19. pp. 180), while

the developmental question is to aid the pupil in arriving at a clear comprehension of classes, rules, principles, etc. It is especially applicable in the inductive approach to general truths, but equally serviceable in making verification of principles assumed (19. p. 181). These two types of question are generally employed in scientific studies or those which exercise reasoning power. Their aim is both to impart knowledge and to train purposive thinking.

3. The questions, through which a teacher tests her own work after a lesson has been given and ascertains whether it has been thoroughly understood, may be called disciplinary or 'examination questions.'

4. Very closely connected with questions for examination are those for review. Here the aim is to impress the facts taught upon children's minds.

5. Another type of question aims exclusively at drill, the establishment of a sort of mechanical association, as employed, for instance, in language studies. Here the attainment of a prompt reply is the sole aim. This type of question is unfortunately abused in our school recitations and often applied to subject-matter for which it is unsuited.

The most fundamental function of questions in most cases is didactic, that is, to stimulate thought in the direction of the solution of a problem, instead of mere verbal memory exercise, drill or habit-formation. It is to lead pupils to recall objects previously known, to bring to consciousness former experiences to give a new meaning. But unfortunately the belief in a "faculty of memory" has led popular educationists to an exaggerated estimate of the value of questions for verbal memory training. Certainly memory is a basal factor for all sorts of learning, as Miss Calkins says, "not only creative imagination but all forms of thought are based on memory." We are, however, skeptical of that sort of teaching which merely aims to equip children with a mass of fragmentary dissociated knowledge in order that they may later in life find a use for it. The teaching of children's memories must be based on rational understanding so that they may be able to control or direct their ideas toward some end, toward the solution of some problem.

According to Stevens' investigation (65. p. 47), an average number of questions during a History lesson of one period is ninety-three, for English, eighty-five; of the former 76.6%, and of the latter 49%, are based directly upon the repetition of the text-book. For example: When was the battle of Waterloo fought? When was Scott born? What kings of England led crusades? Now what do such questions suggest to children? Will they not become merely an incentive to memorize by rote the words of the book, rather than to work out the problem and get ideas of their own? They do not stimulate reflection as do such questions as, for instance: Why do you like the Lady of the Lake better than Marmion? Why is it that Minneapolis could develop so quickly? Compare the quality of A with that of B. By pure memory questions pupils become apparently but not really self-active. Thus Scherer even went so far as to say that the apparently greatest perfection in the art of questioning has as its result the greatest dependency of the pupils (54. p. 27).

Over twenty-five per cent of the more than 300 returns to our questionnaire as to what school subjects were liked or disliked state that the writers liked English literature and History best, if the teachers did not bother them by silly questions on trifling facts and waste time without going into any interpretation or evaluation of the literature itself. This is clearly brought out in the following excerpt:

> "I have had experiences in English literature where we were driven to stand and tell from memory the names of authors, when they were born, where they were born, how long they lived, what books they wrote, when they died, where they died, where they were buried, and so on along the same line. I myself at least was bored to death. I wonder what such study of literature can amount to? Absolutely nothing to me, yes worse than nothing, as I changed my purpose."

The burden that such a study inflicts upon pupils creates a hatred of literature often never overcome. The problem naturally arises, what questions then shall be used? The answer is: analytical and developmental questions, whether the method used be Socratic, inductive or deductive, topical or dialectic.

Dr. Dewey says that "a demand for the solution of a perplexity is the steadying and guiding factor in the entire process of reflection" (20. p. 11). It becomes thus a function of questions to present this demand for the solution of a definite problem as a first step. A general appeal, however, to a child to think, irrespective of his own experience or knowledge is futile. Experience is the anchor of both wisdom and sanity (13. p. 64). Given a problem, the next step is to stimulate thought by a series of interrogations leading each pupil to correct reasoning. This method may, in a certain sense, be called Socratic, but not in the sense which Socrates himself used it. Care should be taken in the use of the so-called Socratic method; for it is primarily intended for adults who have much experience, and moreover it is, in its nature, altogether too destructive. It discourages the child by breaking down his misconceptions, by revealing his ignorance or his absurdity, while it offers him little or nothing of constructive material. Consequently it is likely to force the mind to think along a negative rather than a positive line or to lead to indifference. We may, however, make use of it by rendering it simpler and more constructive (28. p. 376). The teacher stimulates and directs, but never suggests a conclusion or an answer. Pupils are encouraged to present their own thoughts. If correct, the teacher deepens and widens their views by suggestive illustrations. If incorrect, their absurdity is shown by leading them to discover legitimate consequences. Thus the learner at every step feels the joy of discovery and victory instead of discouragement. In all this the teacher is only the stimulator of the pupil's thinking. The secret is: "never suggest anything which you can lead a pupil to find out and tell you." Given a problem, suggestions in the mind of the child follow the laws of association. The greater the fluidity of ideas, and the greater the number of the suggestions that arise, the more likely is the true solution to be obtained; but all these may fail; then only may a questioner suggest the conclusion.

If any suggestion of an answer is given from without and accepted at once, there will be no critical thinking, simply a minimum of reflection. If this kind of interrogation continues for months and years, the child will become a puppet and passive in his thinking, instead of active, self-assertive, and independent of external suggestion.

Another pernicious practice is that of helping or directing pupils too much in their recitations by questions or otherwise. They are never left alone to direct their own steps, and are never afforded any opportunity of self-direction to develop sufficiently the power of initiative. Should it then be a matter of surprise that when left to themselves to think and to decide or solve a problem, they dawdle and get nowhere?

Another method of developing the power of purposive thinking in a pupil is by means of dialectic or discussion. In this method, the pupils present their arguments briefly and pointedly in favor of their respective positions. All criticisms are answered and contested. The reasons for and against are carefully weighed. In these mental conflicts, the utmost power of the pupil is called forth. It not only cultivates mental power, but also self-assertion, independence, courtesy and liberality toward an opponent, and the virtue of fair play. It supplements the so-called Socratic method, by making the pupils think. Of course this method is not applicable to young pupils, but to a certain extent and in somewhat modified form it can surely be utilized for pupils of the later grades and the high schools.

Here it may be instructive to cite an experiment by C. H. King (27. pp. 158-9) on the reasoning powers of children. He gave the following two questions to children of from twelve to fifteen years of age. "The first question runs: There are several clever boys in this class and they are all careless, so a clever boy must be careless. Do you agree with this? The second question is: French people are excitable, so are Italians; so all foreigners are excitable. Is this true? The first question was solved correctly by 144 (44.4%) of all the children who answered, and the second by 172 (56.8%). He concludes that a considerable portion of those who have received a good education and have reached the age of fifteen years fail to show anything but the germs of logical thinking."

Why is this? Why should pupils fail in such simple reasoning? Are these problems beyond their powers? Certainly not.

The habit of reflecting upon the reasons for and against any problem should be promoted by a kind of dialectic method. By a series of suitable questions the pupils are led not only to pause before they react, but also to review or analyze the complex system of factors involved in the case, so that their reaction is made deliberate and rational; otherwise they become mere empirical thinkers, of whom, James says: "Whereas the merely empirical thinker stares at a fact in its entirety and remains helpless or gets 'stuck' if it suggests no concomitant or similar, the (analytic) reasoner breaks it up and notices some one of its separate attributes. This attribute has properties or consequences which the fact until then was not known to have, but which, now that it is noticed to contain the attribute, it must have." MacDougall says: "The ideal type of human action, which all conscious education seeks to develop, is that in which each novel situation is critically reviewed as it arises before it is responded to by an adaptive reaction (instinctive reaction)" (39. p. 381).

Questions may also be utilized to disclose the intellectual or emotional bias of an individual so that reactions or answers may be given without prejudice (34. p. 28). According to Freud, "our mental processes are more rigorously determined than is commonly believed, and many of them generally thought to be causeless have in fact a very precise and definable cause. The same remark applies to many mental processes where we believe that we have a perfectly free choice. Most important, however, is the extension of these principles to the sphere of human judgment, for it is probable that repressed complexes play as prominent a part in distortion of our ideas. On a large scale this is shown in two ways, in the minimum of evidence often necessary to secure the acceptance of an idea that is in harmony with existing mental constellations, or to reject one that is incompatible with these. In both cases it is often the affective influence rather than the intellectual operations that decides the question. The same evidence is construed quite differently when viewed in the light of one affective constellation than when viewed in the light of another" (25. pp. 478, 524).

Wrong ideas and inappropriate propositions enter consciousness through many doors and should be corrected by the influence of opposite ideas which a faithful memory and a sound reasoning provide (43). But if pupils are not trained to look into things, to reflect for and against a given problem, and to judge it fairly, they will be at the mercy of their instinctive reactions and feelings.

The Qualities of Good Questions

It is of prime importance for a teacher to provide a certain mental background necessary for the lesson and harmonize it with her own so that both pupil and teacher may have a closely similar apperception, though not composed of the same elements (2. p. 95). Otherwise a problem under consideration may be looked at from wholly different points of view and there may be a mutual failure in understanding. This is the reason why the teacher so often fails to get correct answers from her pupils. For instance: "Where was St. Paul converted?" asks the teacher, speaking from a geographical point of view; but the pupil responds, "In the ninth chapter of the Acts," from a background of textual reference (2. pp. 95-96). Hence the necessity of bringing the teacher's own mental background into harmony with that of her pupils in order that the questions may be comprehended and answered correctly.

Moreover a question should be clear, concise and logical. The first requisite is its clear comprehension. If the question lacks clearness or is ambiguous, it occasions hesitancy and confusion, so that some children may decline to answer, even when they know the answer well. "An Ohio school teacher asked of her class one day a question, but did not draw the prompt response she expected. With some surprise she turned to one of the boys, saying, 'You know what I want you to say, Johnnie; why don't you say it?' Johnnie replied, 'I know what you want all right, but you ain't asked the question what fetches it." Here the youth, wiser than the teacher, refused to yield up his store of information to an ambiguous question (65. p. 4).

Questions should neither be too universal nor too general. For instance: "Where is Chicago?" may bring out the answers—'In Illinois,' 'on Lake Michigan,' 'in the United States,' etc. All these answers have equal value for such a question.

All these vague questions admit of several equally good answers, according to the different points of view from which different minds regard them; but many teachers think that what is clear to them ought to be equally clear to others, so that when an answer is given contrary to their expectation, it is rejected, even though a perfectly legitimate one; while, if any pupil is fortunate enough to give the precise answer in the teachers' mind, he is commended and rewarded, even though he has given no more thought to the subject (21. p. 91). The really thoughtful and cautious child is merely bewildered by such questions. He remains silent and will be disgusted when an answer is given by his less worthy comrades. The second type is the pupil who is not very clever but shrewd as to the personal peculiarities of his teacher, watches her facial expressions, tone of voice, method and mode of questioning, etc., and discovers easily what she expects. The third type of learner takes a chance by answering at random without thinking it over. He is thus led to form a habit of guessing and insincerity.

Great simplicity of language is another condition. It is better to use as few words as possible, since the function of a question is not only to cause children to say as much as possible, but to avoid confusion, and a loose, pointless answer which is apt to result from a wordy question.

The questions should be adapted to the mind and experiences of the child. An intelligent teacher usually knows in advance which pupils can answer her questions, and this makes possible adaptation of the questions to the pupils. But, unfortunately, it too often happens that a teacher tries obstinately to elicit from the pupil's mind what is not in it. Whenever the question fails to fit the mind of the learner, it presents difficulty after difficulty, and causes embarrassment and confusion, which will cause some pupils to give up all attempts to reply and lead others to imitate their comrades or to reply at haphazard.

One girl says: "When I was in the eighth grade, our teacher used to ask such bewildering questions that most of the class could not understand, but she insisted upon our thinking until we hit upon what she had in her mind. If we did not at once hit upon her thought. her eyes became large and black, her voice harsh and her manner made us feel as though we were the most unintelligent beings possible and as a consequence we became nervous, and gave up any attempt to solve or answer the questions." Examples of such bewildering questions can be found in many educational writings, and we cite a few of them here. Betts says: One teacher asked, "Which phenomena of the fratricidal strife in the American Republic were most determinative of the ultimate fate of the nation?" While in an elementary history class, another teacher propounded this question: "What American institutions have been founded on the principle of social democracy?" (4. pp. 66-67.) Now in all these questions not only the terminology, but the thoughts also are beyond the comprehension of the children. Such questions are not only useless, but confuse and discourage the children, and cause them to lose interest in study. How difficult it is to adapt questions to children is clearly seen from the following examples given as a model by a college professor in one of the largest American universities: "How long do you think it would take a man to walk to the top of a mountain? What would be the difficulties in getting to the top? If you stood on the top and threw a stone, how far down the mountain do you think it would go?" To the writer who was brought up among the mountains, such questions sound nonsensical.

Undoubtedly with many pupils under the conditions created by a series of ill-adapted questions, the brain becomes inhibitive or a storm center of opposing nervous impulses and the mind loses all docility. The following investigation may throw some light upon this point. In 1909, Miss Helen Todd (67. pp. 73-74) took 500 children from twenty different factories and asked them the question: "If your father had a good job and you didn't have to work, which would you rather do—go to school or work in a factory?" Four hundred and twelve said they would rather work in a factory and gave among others the following reasons: "Because it is easier to work in a factory than it is to learn in school;" "You never understands what they tells you in school, and you can learn right off to do things in a factory;" "They ain't always picking on you because you don't know things in a factory;" "It's so hard to learn;" "I couldn't learn;" "When you works a whole month at school, the teacher she gives you a card to take home, that says how you ain't any good."

These cases might be diminished by well-adapted questioning which will give a child success and hence pleasure and an incentive for further attempts. Every teacher has noticed with what enthusiasm and vigor children take up different tasks in their school lessons after they have been successful in the solution of some problem. "Not all the coaxing, or scolding, or moralizing in the world would fit them half so well to take up the new work, as the victory already won" (12. p. 112). Belief in power begets power, in weakness, begets weakness. Upon self-confidence depends the mental development of the child (47. p. 267). Hence it is important for mental hygiene to give children a chance for success, and to arouse self-confidence in their ability; and this is the very task of questioning. It goes without saying that it is also important to allow a slight failure once in a while as a specific medicine. Meumann illustrates the importance of the self-confidence of a child in his own power from the experience of a boy whom he knew.

> When a thirteen-year-old boy entered a new school, his previous teacher who had an antipathy to him, introduced him to the new teacher in a tactless manner with false report. From that moment the boy, who so far had done work above the average, could do nothing more, his intellectual efforts diminished from day to day, behavior deteriorated, and he became shy and depressed. At the end of the year he failed to be promoted, and would have gone to pieces, had not his parents taken him away. In the new school he met a teacher who showed confidence in him, and from that moment he changed completely, and left the school as one of the best pupils. Meumann gives this case as typical in that a single definite volitional inhibition entering into the life of the child, extended to his whole inner nature, discouraged his self-confidence, depressed his affective life, and decreased all his performances intellectual as well as moral (42. p. 298).

The effectiveness of such a volitional inhibition is most easily observed in the psychological laboratory-tests on immediate retention (42. pp. 298-300). We cite also one of our questionnaire returns.

> A girl writes: "Behind the teacher's tones and expressions I have usually been able to read her attitude to the class and towards myself. When I know that a teacher has entire confidence in me and expects a certain response on my part, the most difficult subject becomes easy to me. On the other hand, when a glance tells me that my ability to answer is questioned, no matter how carefully the lesson has been prepared, my power over the subject seems to depart, and I fail in general."

Children are very susceptible to such volitional inhibitions; and such an inhibition is too frequently caused by ill-adapted questions which simply bring about failure after failure, or by the unsympathetic sarcasm of the teacher or the like.

Questions Should Not Be Numerous

A multiplicity of questions is likely to discourage and fatigue children because of the monotony of the procedure. According to Stevens' investigation, already referred to, the number of questions in one recitation period is, on an average, 85.3 for English, 81.2 for History and 81.4 for Science. That is, the children are asked about two questions per minute. Embarrassment, repulsion, constraint, weariness, etc., will often be the outcome of such a method of numerous questions, as the following excerpt illustrates: "There is one teacher who asks question after question and does nothing else for a whole period; and everything becomes monotonous and one feels really wearied so that one can not understand what is going on." Another girl says: "As a result of too many questions we become indifferent;" still others say that they become nervous and impatient.

Effectiveness and leadership in social life depend on the ability to express one's self adequately on the topic under consideration. But in the schoolroom the number of questions, whether good or bad are apt to be so large that there is no time left for complete expression of thought. The pupils are allowed merely to punctuate the questions with monosyllabic answers, or with a few words. The following example from a lesson on "The Lady of the Lake" will illustrate the point (65. pp. 38-42, 66). The number of questions asked in one recitation period was 105 out of which 60 were answered with less than five words:

T. We will see; hold your judgment until the end, and see. How much is description used in the story, Mr. J.? Is there very much?
P. Quite a little.
T. For what did it seem to be put in?
P. I think one place the Canto starts very quietly, and then the clan gathered in the fiercest preparation, terrible oaths, shows contrasts.
T. Is it put in then, just as a scene, or for some distinct purpose?
P. Distinct purpose.
T. And in this case it was?
P. Contrast.
T. What other descriptions?
P. Nature.
T. Very much space taken up with descriptions of nature?
P. Yes.
T. Have you a pretty fair idea of the country?
P. Yes.
and so on.

The questions should be made so that every child may have frequent incentives to answer in well-articulated sentences. Dr. Lay says (32a. pp. 303-4) that "too great emphasis has been put upon questioning without thinking, that in the schoolroom is fostered a form of conversation that has an analogy in the court room alone. He further says: "The natural form of conversation should be preserved in the schoolroom, especially, since the question is unpleasant or even painful to most children. The child must have freedom to follow his own thought process, not that of the teacher." And for this purpose, description, narration, and exposition, or in other words, the method of our spontaneous report is very desirable. We are, however, by no means inclined to slight the questions and questioning, but simply to guard against the use of too many fragmentary questions. An interchange of all these methods of description, exposition, narration and good questions contributes to freshness and interest. It is, of course, too much to demand a complete sentence for every question, and again it is pedantry to banish all questions that can be answered by "yes" or "no." We need, however, to be sure that a sufficient reason follows or precedes the answer, so that the 'yes,' or 'no' may neither be a mere guess nor an automatic expression.

Here it may be worth noting that the teacher who accepts vague and indefinite answers incidentally encourages slovenly habits of thought and fosters guessing. A child is quick to take advantage of the teacher who will accept any sort of an answer and interpret it as a statement containing thought. Indeed, a child may even come to think that his incoherent statements, his word juggling, really represent thought (66. pp. 110-111). Worse than this is the danger that a teacher may lead the child to insincerity of speech. Instead of truth, he will have appearances; instead of real powers, presumptuous weakness; instead of sincerity, hypocrisy.

Again, it seems even better to permit the pupil to blunder through to the end of his recitation and correct him than to disturb him in the midst of his speech.

> A Normal School girl says: "A certain teacher I once had was very impatient. Before I would go to the room I would know the lesson almost word for word. When she called on me to recite, if she did not interrupt me, I could finish the recitation, but as soon as she began to ask many questions and then scold if they were not answered correctly, I would forget the work which I had before known so thoroughly, and as a result would fail." (Thirteen cases.)

Moreover the method of numerous questions means that things and their qualities are torn apart, retailed and detailed, without reference to their more general character, and thus the child is not only hindered from seeing the "forest on account of the trees," but also the firm retention of the subject-matter is rendered very difficult (20. p. 97).

Time Should Be Given for Answering

Rapidity in questioning intensifies the attention of children to great advantage and is undoubtedly necessary for pedagogical purposes, but its dangers should not be overlooked.

First of all, speedy questioning emphasises the quantity instead of the quality of the work. When a teacher demands of each pupil to answer quicker than the other for the sake of a brilliant showing, a premium is put upon feverish activity, regardless of the cost to the pupils. According to the experimental results of Hillgruber (1), Rusk (52), Meumann and others, under the compulsion to work as quickly as possible, the amount of work will be far greater than that obtained without such force. Ach (1. p. 2) says: " It is due to the law of difficulty as motivation, that is, to the fact that the difficulty of a forced task motivates a more intense effort of Will and concentration of attention on the present problem." " With the increase of the difficulty," he continues further, " the effort of Will increases instinctively and acts in favor of the work quantitatively." But another aspect of their experimental results confirms our theory as well as Meumann's that under the influence of the compulsion to work as quickly as possible the quality of the work deteriorates. This is certainly due to the interference of association caused by excitement, confusion, lack of time, etc. It is obvious that sufficient time is needed to comprehend the questions correctly and to make correct comparison, discrimination, and true inference as well as call forth right associations or to make orderly associations with the old. The child needs a longer time for individual ideation, and the ideas with which the child works are not at prompt disposal for him in spite of his accurate possession (42. p. 231).

Meumann found from his experiments that when rapidity of response is a controlling factor, a stimulus word is comprehended in the most cursory fashion, so that the reproductions are of little value, but with lengthening of the reaction time in general is noted an increase of the qualitative value of the work. He concludes that for tests with a problem to be solved, the instruction " as quickly as possible " is detrimental (42. p. 232). The results of Rusk indicate that for different children the speed of association has little value as an indication of the intelligence of the learner (52. u. 102). The children who reply most quickly are not necessarily of the highest intelligence. An exceptionally good memory is often found to co-exist with very low intelligence (52. p. 151).

On the other hand, Müller and Pilzecker, and Bigham (5. p. 458) also, found that right associations are reproduced more quickly than false; in other words, those ideas which can be reproduced easily are usually truer than those whose recall is difficult, whether this be due to pure forgetfulness or to the confused association with kindred ideas. This again shows that questioning should not be too speedy, since speedy questioning will overlook the false association that should be corrected and cleared.

The experimental results of Franken (22. pp. 239-243) tell us that the lengthening of the time for reflection (*Bedenkzeit*) brings about a quantitative increase but a qualitative degeneration, since the increase of right answers is smaller than that of false ones. This result apparently contradicts our theory, but a closer study shows that there is no conflict, but agreement. In Franken's experiment, the observer gave only those answers that were most clear and certain to him, and with the brief interval for reflection, all doubtful answers are rejected. (22. pp. 227-229.) Furthermore his result shows, that the mean variation varies with the length of the time for reflection; it increases if the time is lengthened and decreases if this is shortened; that recollection needs a certain time, and if, before its process is complete, questions and hence ideas and answers, crowd themselves in consciousness, the recollection will be disturbed and hindered (22. pp. 227-9; 241).

Second: rapid questioning ignores individual differences (59. p. 215), and consequently fosters shallow thinking or guessing. What one pupil solves in a second, another may spend a minute in solving (3. p. 243). Meumann says that: " The concrete thinking of a child is surprisingly slow; in some cases, he takes almost ten times as long as the adult to respond to a stimulus equally familiar to both " (42. pp. 227-8). Children who are more ambitious are apt to answer more quickly than others. Temperament also makes a great difference. The results of Rusk's experiments also disclosed great individual differences in the rates of reaction. For example, an investigation with three boys of the same age and intelligence revealed the fact that one of the boys invariably took three times as long as the other two to respond to the stimulus words. The work presented no difficulty, yet his normal rate of reaction was considerably slower (52. pp. 102-3). The teacher of these three boys, although they had been under his care for years, was unaware of any such difference, and probably, in oral questions, this boy owing to his slower rate of response, would appear at a disadvantage (53. p. 837). Bader (3. pp. 102-104) obtained similar results, among his five observers those whose reaction-time was shortest gave the poorest answers.

Furthermore, what effect does a demand to answer " as quickly as possible " have upon the mind of the child? Bader's experiment teaches us that the observer focuses his attention on the act of answering quickly as a result of pressure. Thus those whose natural disposition forces them to a quick reply are still more incited by the stimulus and give flippant, unconsidered answers, while those who are by nature reflective feel in the procedure an unaccustomed impulse (3. pp. 243-4). In both cases, as a result, quickness of solution takes place at the cost of quality. To make these results clear, let us cite a few introspective reports of Bader's observers: observer E says: "The task of replying quickly influences consciousness and drives me to do so." Observer F says: "The idea, 'you must reply as quickly as possible,' is always very vivid and governs everything else." F further says "I do not know why I have said that word. Oh, yes, in an endeavor to answer as quickly as possible, I did not take time to give a sentence, but brought quickly merely a word." B says: "I would have answered differently. At all times I was clear that it (the answer) was false, but I thought that I needed too long a time to do otherwise; and hence I spoke so quickly" (3. p. 100).

Any demand for speedy reactions deprives a child of time for suspension of judgment and weighing the evidence pro and con; it prevents him from appealing to concrete experience latent in his mind, but encourages him to accept any suggestion from within as well as without and to react at random. As a result such a method may bring about mental automatism, a habit of instinctive, premature reaction. We should keep in mind that the class room is not a vaudeville stage for displaying or rehearsing the mere strength of verbal memory, but a laboratory for testing, getting, verifying, using and developing knowledge, in a word, for the training of purposive thinking.

It is the function of questioning to make children understand first of all the meaning of the question and to make an orderly association between the question and ideas in the answer. A question erroneously comprehended may not only evoke the wrong answer but may also cause an interference of association. Now it happens quite often that when a question is asked under the spur of answering quickly, many children raise their hands first and then think about the problem. The answers are given frequently before the question is fully understood. With frequency of such a mode of questioning and answering, the child may finally become habituated to a mode of thinking in which the attention, critical insight and examination of the inner process present between the question and answer is neglected.

From what has been said it follows that the rate or tempo of questioning should be carefully considered for different ages and classes of children so as to allow just sufficient time for good reaction. (52. p. 104.)

It is a matter of course that when questions are put for the sake of drill or of the review upon memorized matter, they may be asked with emphasis and rapidity; but even then, the individual differences in reaction time and the influence of the command to answer "as quickly as possible" upon the observer should be kept in mind.

A large number of rapid questions is injurious both to mind and body. As Stevens says, "a large number of rapid questions keeps children in a highly strung nervous tension where there should be natural and normal conditions (65. p. 171). It is certainly injurious to the nervous organism to live in such a high-pressure atmosphere."

One girl says: "One of my teachers by her mode of speedy questioning causes me to put all of my mental powers on the questions in hand. After spending an hour with that teacher I feel really tired and nervous so that I can not do anything until I have time to recover from my nervousness."

Another girl reports: "There is a teacher who affects me very much. When I enter her room I am as calm and composed as anyone else should be, but when I leave it I am worked up to such a nervous pitch that I am almost unable to go on with the work of the next hour. It is caused, I believe, by the teacher's incessant calling upon us for answers and recitations." (Seventeen cases.)

Some individuals can do mental work with far less waste of energy than others even under pressure, but most of us are apt to be made nervous and excitable by undue nervous stress. In some cases, excitement, fatigue and anxiety may cause the beginning of pathological neuroses.

A girl reports: "At one time I had a teacher who was extremely nervous. When she called on her pupils for answers and recitations, she hardly gave them time to recite or answer by calling for answers, but she would supply words; and just by her whole manner and her mode of questioning she made her pupils so nervous that some forgot everything they knew, some became restless and some of my classmates gave way even to the nervousness in spells of crying."

It is especially noteworthy that this speedy habit of reaction and thinking formed by such a method may persist even till late in life and hinders the victim from quiet, deep, and connected thinking.

Some teachers may say that the ability to concentrate attention on a problem should be cultivated, and hence speedy questions must be used. It is certainly true that the attention of a child is very likely to be dulled by even a few minutes' exposition and that it is aroused by animated questions; but we must not forget that a multiplicity of speedy questions also tires and disgusts the children. After a few minutes, their attention again flags; they will no longer listen to the inquiries of the obstinate questioner, and they will answer only at random, thanks to the defensive mechanism of nature. Hence the method of rapid questioning will rather kill than form the habit of attention. Attentive moment and relaxation-moment should alternate. Above all, it is desirable that attention be paid to the meaning of the question and to the quality of an answer, not to the form of the question nor to the teacher.

Too slow questioning is, however, detrimental for the education of the will (1. pp. 3-4). The best method may, as Ach suggests, be to let children work at times under the spur of obtaining good results as quickly as possible but with intervals of relaxation. This method conditions an increase of the effort of the will and brings about the best result both qualitatively and quantitatively (1. p. 3).

Still another point to be considered is that sometimes even the brightest children and some adults too fail to answer in spite of knowledge, when asked a question suddenly, unexpectedly, or at an examination. The writer's own experience and observation show that such a question causes a sudden arrest of psychic activity, or that there arises out of unconscious complexes an apparently unrelated idea. Thoughts refuse to flow freely, only to lead one to an utter failure, even when well prepared in the subject. The nerve centres for the time seem paralyzed; as soon as one is alone or with a sympathetic friend, the obstruction gives way, and clear-cut correct answers which he might have given in reply to the questions raised are readily thought of.

Psychologically such a sudden mental arrest may be due to fear, excitement, a feeling of unpreparedness, lack of self-confidence, timidity, shyness, embarrassment, or excessive ambition.

Whatever the cause may be, the fact remains the same. It is absurd to judge children's mental ability through the answers to such questions. Moreover a failure may injure their future work through volitional inhibition.

In conclusion it may be wise to add that for individuals who have a normal nervous system, adequate nutrition and abundant rest, and especially plenty of sleep, excitement and explosion of energy once in a while may be as essential as rest and the storing of energy. Normal children must be trained to work occasionally under pressure so as to be prepared for the struggles of their future life. To shield pupils entirely from tests of strength is to rear them in weakness and timidity (44. p. 118).

Finally, the limits which should be observed in the rate and tempo of questioning and in regard to the functions of questions in general, that they may be useful and not harmful to mental development are problems to be studied seriously by every teacher.

CONCLUSION

Experimental evidence from our own investigations and those of others give the following tentative results:

1. Children attempt the *Bericht* with a different mental attitude from what they have toward the *Verhör;* for example, some children reported correctly in the *Bericht* what they answered wrongly in the *Verhör,* while other children make false statements in the *Verhör* in regard to what they reported correctly in the *Bericht.*
2. The weakness of the *Bericht* seems to be the outcome of three factors. (1) Pedagogically, it appears to be due to passivity of the mind induced by habituation to the questioning method and lack of initiative. (2) Psychologically, it may be due to interference or weakness of association that children fail to recall in the *Bericht* what they can by the aid of questions. (3) It is undoubtedly in part due to the fact that children's interest is not equally distributed to each detail, and hence they fix their attention on the more interesting facts.
3. The large number of errors in the *Verhör* is due not only to the passivity of the mind and the suggestive character of the questions, but also to the fact that children's mode of viewing things is wholly different from that of adults, while the questions are asked from an adult point of view.
4. The experimental results show that many children can do better in the *Bericht* than in the *Verhör.* In view of this fact is it justifiable to determine the grade of children by the questioning method alone?

SUMMARY OF PRACTICAL INFERENCES

1. The *Bericht* is far more trustworthy than the *Verhör,* but the range of the former is far smaller than that of the latter.
2. Either method is defective for testing children; both should go hand in hand.
3. All questions, whatever their form, have a suggestive influence; and hence children should be trained to guard against suggestion and to react to the content and not the form of questions.

4. Children are suggestible to external as well as internal stimuli. They should be trained to withstand unfortunate suggestions.

5. Children should be trained to formulate questions themselves on what they have to learn or have learned.

6. All questions, except those for drill and experimentation, should be for purposive thinking.

7. The rate and tempo of questioning should be regulated according to the subject matter and the individual differences in reaction time.

8. The number of questions should not be too numerous.

9. Questions should neither be too difficult nor too easy, but well adapted to the pupil's mind.

10. Questions should be clear and logical.

11. They should be given in few words.

12. Vague, indefinite, and fragmentary answers should not be accepted.

13. If possible to avoid it, an answer should not be interrupted.

Bibliography

1. Ach, N. Willensuntersuchungen in ihrer Bedeutung für die Pädagogik. Zeit. f. Pädagogische Psychologie und experimentelle Pädagogik. 1913, vol. 14, pp. 1-11.
2. Adams, John. Exposition and Illustration in Teaching. N. Y., 1910. 428 p.
3. Bader, P. Die Wirkung der Frage. Pädagogische-Psychologische Arbeiten. 1912, vol. 13. 252 p.
4. Betts, J. H. The Recitation. Boston, 1911. 120 p.
5. Bigham, J. Memory. Psy. Rev., 1894. vol. I, pp. 453-461.
6. Binet, A. La Suggestibilité. Paris, 1900. 391 p.
7. Bleuler, E. Affektivität, Suggestibilität, Paranoia. Halle, 1906. 144 p.
8. —— ——. The Theory of Schizophrenic Negativism. Trans. by W. A. White. J. of Nervous and Mental Disease. N. Y., 1912. No. 11. 36 p.
9. Borst, Marie. Experimentelle Untersuchungen ueber die Erziehbarkeit und die Treue der Aussage. Beit. z. Psy. d. Aussage. Leipzig, 1904. Vol. 2, pp. 73-121.
10. Dürr-Borst, Marie. Die Erziehung der Aussage und Anschauung des Schulkindes. Die exp. Päd., 1906, vol. 3, pp. 1-30.
11. Breukink, H. Über die Erziehbarkeit der Aussage. Zeit. f. ang. Psy., 1909-10. Vol. 3, pp. 32-87.
12. Bryan, E. B. The Basis of Practical Teaching. N. Y., 1905. 190 p.
13. Burnham, W. H. Arithmetic and School Hygiene. Ped Sem., 1911. Vol. 18, pp. 54-73.
14. Chomjakov, M. M. Zur Frage der Suggestibilität. Beit. z. psy. d. Aussage. 1905, vol. 2, pp. 221-223.
15. Claparède, E. M. Expériences collectives sur le témoignage. Arch. d. psy. 1906. Vol. 5, pp. 344-387.

16. Cohn, Jonas, and Dieffenbacher, J. Untersuchungen über Geschlechts-, Alters- und Begabungs-Untedschiede bei Schülern. Zeit. f. ang. psychologie u. psychologische Sammelforschung. Leipzig, 1911. Beiheft 2, pp. 2-15, 50-98, 188-211.

17. Cohn, Jonas, and Gent, W. Aussage und. Aufmerksamheit. Zeit. f. ang. psy. u. psychol. Sammelforschung. 1908. Vol. 1, pp. 129-152, 233-265.

18. Cooley, C. H. Human Nature and the Social Order. N. Y., 1902. 413 p.

19. De Garmo, C. Interest and Education. N. Y., 1902. 230 p.

20. Dewey, J. How We Think. Boston, 1910. 224 p.

21. Fitch, J. The Art of Teaching. London, 1908. 117 p.

22. Franken, A. Aussageversuche nach der Methode der Entscheidungs-und Bestimmungsfrage bei Erwachsenen und Kindern. Zeit. f. ang. psy. und psychologische Sammelforschung. 1912. Vol. 6, pp. 174-253.

23. Goddard, H. H. The Binet-Simon Measuring Scale for Intelligence. The Training School, 1911. Vol. 8. 16 p.

24. Grosser, H. Die Psychologie der Aussage in ihrer pädagogischen Bedeutung. Die Kinderfehler. 1906. Vol. 11, pp. 225-235.

25. Jones, E. The Psychology of Everyday Life. Am. Jour. of Psy., 1911. Vol. 22, pp. 477-527.

26. Keatinge, M. W. Suggestion in Education. London, 1907. 202 p.

27. King, C. H. The Reasoning Power of Children. Paidologist, 1903. Vol. 5, pp. 157-162.

28. Klapper, P. Principles of Educational Practice. New York, 1912. 485 p.

29. Kosog, O. Wahrheit und Unwahrheit bei Schulkindern. Die Deutsche Schule. 1907. Vol. 11, pp. 65-78.

30. —— ——. Suggestion einfacher Sinneswahrnehmungen bei Schulkindern. Beit. z. Psy. d. Aussage. 1904. Vol. 2, pp. 385-400 (or 99-114).

31. Krebs, S. L. Law of Suggestion. Chicago, 1906. 157 p.

32. Lay, W. A. Experimentelle Didaktik. Leipzig, 1910. 661 p.

32a. Lay, W. A., and Enderlin, M. Führer durch das erste Schuljahr. Leipzig, 1911. 434 p.

33. Lipmann, O. Die Wirkung von Suggestivfragen. Zeit. f. ang. Psy. 1907-8, vol. 1, pp. 44-92; 382-415; 504-546. 1908-9, vol. 2, pp. 198-242.

34. Lipmann, O. Grundriss der Psychologie für Juristen. Leipzig, 1908. 80 p.

35. Lipmann, O. und Wendriner, E. Aussage-Experimente im Kindergarten. Beit. z. psy. der Aussage. 1904-5. Vol. 2, pp. 418-423.

36. Lipmann, O. Ein zweites psychologisches Experiment in kriminalistischen Seminar der universität Berlin. Beit. z. psy. d. Aussage. Leipzig. 1904-5. Vol. 2, pp. 198-202.

37. Lipps, T. Leitfaden der Psychologie. Leipzig, 1909. 396 p.

38. Lobsien, Max. Aussage und Wirklichkeit bei Schulkindern. Beit. z. Psy. d. Aussage. 1903. Vol. 1, pp. 158-221 (or 26-89).

39. MacDougall, R. Contrary Suggestion. Jour. of Abnormal Psychology. 1912. Vol. 6, pp. 368-391.

40. McDougall, W. Introduction to Social Psychology. London. 1908. 355 p.

41. Matthias, Adolf. Praktische Pädagogik für höhere Lehranstalten. München, 1895. 397 p.

42. Meumann, E. Vorlesungen. Leipzig, 1907. Vol. 1. 555 p.

43. MÜNSTERBERG, H. On the Witness Stand. New York, 1908. 269 p.
44. OFFNER, M. Mental Fatigue. Trans. by G. M. Whipple. Baltimore, 1911. 131 p.
45. OPPENHEIM, ROSA. Ueber die Erziehbarkeit der Aussage bei Schulkindern. Beit. z. Psy. der Aussage. 1904-5. Vol. 2, pp. 339-384.
46. PILLSBURY, W. B. The Psychology of Reasoning. N. Y., 1910. 306 p.
47. PLECHER, H. Die Suggestion im Leben des Kindes. Zeit. f. Kinderforschung. 1909. Vol. 14, pp. 257-269; 289-307.
48. RANSCHBURG, P. Leicht Schwachsinnige als Zeugen. Eos. 1907. Vol. 3, pp. 81-101.
49. REVESZ, M. D. Experimentelle Beiträge zur Psychologie der moralisch verkommenen Kinder. Zeit. f. ang. psychologie u. psychol. Sammelforschung. 1911. Vol. 5, pp. 272-330.
50. RODENWALDT, E. Ueber Soldatenaussagen. Beit. z. Psy. d. Aussage. 1905. Vol. 2, pp. 287-337.
51. ROHDE, M. Zeugenaussagen Geisteskranker. Zeit. f. ang. psy. u. psychol. Sammelf. 1908-9. Vol. 2, pp. 12-50; 243-279.
52. RUSK, R. R. Introduction to Experimental Education. N. Y., 1912. 303 p.
53. —— ——. Experimental Education. Jour. of Education. 1910. No. 32, pp. 835-838.
54. SCHERER, H. Die Pädagogik der Gegenwart. Leipz. 1913. 213 p.
55. SCOTT, W. D. Personal Differences in Suggestibility. Psy. Rev. 1910. Vol. 17, pp. 147-154.
56. SEASHORE, C. E. Measurements of Illusions and Hallucinations in Normal Life. Yale Psy. Lab. 1895. Vol. 3, pp. 1-67.
57. STERN, CLARA and STERN, W. Erinnerung, Aussage und Lüge in der ersten Kindheit. Leipzig, 1909. 160 p.
58. STERN, W. Die Aussage als geistige Leistung und als Verhörsprodukt. Beit. z. Psy. d. Aussage. 1904. Vol. 1, pp. 269-415 (1-147).
59. —— ——. Die Differentielle Psychologie. Leipzig, 1911. 503 p.
60. —— ——. Zur Psychologie der Aussage. Berlin, 1902. 56 p.
61. —— ——. Wirklichkeitsversuche. Beit. z. Psy. der Aussage. 1904. Vol. 2, pp. 1-31.
62. —— ——. On the Psychology of Testimony and the Study of Individuality. Am. Jour. of Psy. 1910. Vol. 24, pp. 270-282.
63. —— ——. Aussagestudium. Beit. z. Psy. d. Aussage. 1903. Vol. 1, pp. 46-78.
64. —— ——. Bericht, Beiträge z. Psy. d. Aussage. 1903. Vol. 1, pp. 259-263 (or 123-127).
65. STEVENS, ROMIETT. The Question as a Measure of Efficiency in Instruction. N. Y., 1912. 95 p.
66. STRAYER, G. D. A Brief Course in the Teaching Process. N. Y., 1911. 315 p.
67. TODD, HELEN. Why Children Work. McClure's Magazine 1913, April. Vol. 40, pp. 68-80.
68. WELLMAN, F. L. The Art of Cross-Examination. N. Y., 1905. 404 p.
69. WIGMORE, J. H. Professor Muensterberg and the Psychology of Evidence. Illinois Law Review, 1909. Vol. 8, pp. 399-445.
70. WRESCHNER, A. Zur Psychologie der Aussage. Archiv. f. gesamte psychologie. Vol. 1, pp. 148-183.

APPENDIX

The questions used in the experiments described above are based on the section (p. 259) on the Guianas in C. C. Adams' Elementary Geography and the section (pp. 18-19) on the Surface of South America in A. E. Frye's Grammar School Geography. "The Guianas: The three Guianas (B. D. and F.), are mainly devoted to the growing and manufacture of cane-sugar and its by-products, rum and molasses. Cultivation is confined almost wholly to a narrow coast strip, where most of the people live. Owing to the decline in the price of sugar the British and Dutch planters are replacing sugar-cane to some extent with coffee and cacao. An important amount of gold is mined in the interior, the British producing the larger part of it. Georgetown and New Amsterdam, the chief towns of British Guiana, owe their importance to the palmy days of the sugar trade. Great Britain and the United States take nearly all of the exports of this colony—sugar, gold, rum, rubber, rice, and molasses. Great Britain supplies half and the United States one fourth of the manufactures, food, and coal imported. Paramaribo is the commercial center of Dutch Guiana, nearly all of whose trade is with the Netherlands. French Guiana (port, Cayenne) is less developed than the other colonies, and includes phosphates among its exports. Its trade is mainly confined to France."

A. Tell what you know about the colonies of the three Guianas. (For the *Bericht.*)

B. Series of questions for the *Verhör:*

1. To what manufacture are the three Guianas mainly devoted?
2. What by-products are obtained from that manufacture?
3a. Do most of the people of the Guianas live along the narrow coast line?
3b. Do most of the people of the Guianas live in the interior?
4. What are the British and Dutch planters planting in place of the sugar-cane?
5. Why do they do that (referring to question 4)?
6a. Is an important amount of gold mined in the interior?
6b. Is an important amount of gold mined on the coast line of the Guianas?
7a. Does British Guiana produce the larger amount of gold (than the other Guianas)?
7b. Does British Guiana produce the smaller amount of gold (than the other Guianas)?
8. Mention the names of the chief towns of British Guiana.
9. To what do those towns owe their importance?
10a. Is the cultivation of the sugar-cane confined almost wholly to a narrow coast line?
10b. Is the cultivation of the sugar-cane confined in the interior of the Guianas?
11. What products are exported from British Guiana to Great Britain and the U. S. A.?
12. What things are exported from French Guiana?
13a. Isn't French Guiana less developed than the other Guianas?
13b. Isn't French Guiana more developed than the other Guianas (other colonies of the Guianas)?
14. What things are imported from Great Britain and the United States to British Guiana?
15. What is the commercial center of Dutch Guiana?

16a. Isn't the trade of Dutch Guiana chiefly confined to the Netherlands?
16b. Isn't the trade of Dutch Guiana chiefly confined to the U. S. A.?
17. With what country does French Guiana mainly trade?
18. What is the chief town or port of French Guiana?

South America has the shape of a triangle towards the south. Its coast is not so broken as that of North America. In general the surface of South America resembles that of North America. Each has its greatest or primary highland on the west, with lesser highlands on the east, and a great plain between. The highland which lies along the west coast of South America is known as the Andes highland, or simply the Andes. It is not nearly so wide as the Rocky mountain highland, but it has much higher plateaus. Over the eastern part of South America spreads a low but broad plateau, not nearly so high as the Andes. This plateau is mainly in the eastern half of a country called Brazil and is known as the highland of Brazil. The western half of Brazil is part of the Central plain and contains vast forests called selvas. Most of the trees grow in the lowlands along the rivers that form the Amazon system. The Amazon river and its branches drain the largest river basin in the world. The selvas are in this basin. Most of the largest rivers of the Amazon system flow from the Andes highland. The part of the Central plain south of the selvas is grassy and supports millions of cattle and horses. In that land such grassy plains are called pampas. The parts of the Central plain north of the selvas are called 'llanos,' meaning level land. There also the people raise many cattle.

A. Tell what you know about the surface of South America. (For the *Bericht.*)

B. Series of questions for the *Verhör* are as follows:

1. What is the shape of South America?
2. Which part of South America is widest?
3. The coast of Australia is regular, that of North America is irregular. How is the coast of South America?
3a. Is the coast of South America less irregular than that of North America?
3b. Is the coast of South America as irregular as that of North America?
4. Towards what direction does South America taper?
5. In what part of the country does a great plain of South America lie?
6. Along what coast of South America does the primary or greatest highlands lie?
7. What is the name of that primary (or greatest) highland?
8. Compare the height of that primary highland of South America with that of the Rocky Mountain highland.
8a. Has not that primary highland much higher plateaus than the Rocky mountain highland?
8b. Has not that primary highland much lower plateaus than the Rocky mountain highland?
9. Compare the width of that primary highland with that of the Rocky mountain highland.
9a. Is that primary highland of South America narrower than the Rocky mountain highland?
9b. Is that primary highland of South America as wide as the Rocky mountain highland?

10. Over what part of South America does a low but broad highland (or plateau) spread?
11. What is the name of that low but broad highland?
12. Why is it so called?
13. South America has highlands and lowlands. Where do most of trees grow there?
13a. Do not most of the trees in South America grow on the lowlands?
13b. Do not most of the trees in South America grow on the highlands?
14. How large is the Amazon river basin compared with the other rivers in the world?
15. From what highland do most of the largest rivers of the Amazon system flow?
16. What country has a surface very similar to that of South America?
16a. Does the surface of South America differ from that of North America?
16b. Does the surface of South America resemble that of North America?
17. Locate the grassy plains of South America.
18. What is the grassy plain of South America called?
19. In what regions are most of the cattle raised in South America?
19a. Do the people of South America raise many cattle on the plain?
19b. Do the people of South America raise many cattle on the highland?
20. What part of South America is called 'llanos?'
21. What does 'llanos' mean?
21a. Does not 'llanos' mean highland?
21b. Does not 'llanos' mean level land?
22. What are the vast forests in Brazil of S. A. called?
23. In what river basin are those vast forests?
24. Which half of Brazil is a part of the central plain?
24a. Is the western half of Brazil a part of the central plain?
24b. Is the eastern half of Brazil a part of the central plain (of South America)?

THE VOCABULARY OF A CHILD AT FOUR AND SIX YEARS OF AGE

By Eugene C. Rowe and Helen Niles Rowe

That sinecure of the elementary school—the language lesson,—is such not because of any malfeasance on the part of the teacher but because of the helplessness bred of ignorance. To stimulate and control language development intelligently and skillfully, necessarily demands a knowledge of the laws of language development. Perusal of the chapters on language in the pedagogical text-books, however, still shows a dearth of such knowledge. It seems clear that to become practically more fruitful the psychology of language, still in its infancy, must become genetic. This in turn necessitates the careful gathering of much concrete data, the analysis of which may yield the required laws and knowledge necessary for skillful guidance.

It is with the hope of contributing some small "pepper-corn" to the data required for a genetic psychology of language that the following vocabulary, taken at the age of four and again at six, is here presented.

The plan used was the following: Some one with a note-book and pencil, usually one of his parents, was with S. from the time he awoke until he went to sleep recording each word used. This was begun on the fourth birthday and kept up for ten weeks. The same process was repeated and for the same length of time, beginning on the sixth birthday. To make sure that the complete vocabulary was obtained this work was in each case supplemented by going through an abridged dictionary and listing all words known to have been used by S. and not already recorded. Only a few words—perhaps twenty-five—were added from this source. Excepting proper nouns S. used practically his entire vocabulary at four and again at six within a period of ten weeks.

Only the spoken vocabulary is here included, no attempt being made to secure a list of terms understood over and above those actually used. S. used very little baby talk and what had been used had practically disappeared by his fourth birthday. Such terms are not included. It was hoped that the vocabulary might be taken again at eight but this plan had to be abandoned because practical demands made it impossible to follow S. to school morning and afternoon for a period of weeks.

Words at Four Years of Age.

A

able
about
ache
aches
across
act
acting
actually
add
added
afraid
after
after-noon
afterward
again
against
age
agent
ago
ah
aim
aimed
aiming
air
alarm
alarm-clock
alive
all (n & v & adj)
alley
alligator
allow
almost
alone
along
aloud
already
always
ammunition
among
amount
an
and
animal
another (a & pro)
answer (n & v)
answering
any, (a, adv, pro)
anybody
anyway
anywhere
apple
apple-sauce
apple-tree
April-fool
apron
are
armed
armful
army
around
arrange
arrest
arrow
arrow-head
artichoke
as
ashamed
ashore
aside
ask
asked
asking
asleep
asparagus
at
attack (n & v)
attention
attic
aunt
automobile
avenue
awake
away
awful
awfully
awhile
awoke
axel

B

baa
baby
baboon
bacon
back (n & adv & a)
backing
bad
badly
bag
bait
baited
bake
baker-man
ball
balloon
bamboo
banana
band
bang
banister
bank
banner
bantam
barber
barb-wire
bare
barely
barn
bark (n & v)
barrel
basket
basket-ball
basin
base
base-ball
bass
bass-wood
bat (v & n)
bath
bathe
bathing
bathing-suit
bath-robe
battle
bay (a & n)
bay-window
bazaar
be
beach
bead
beak
bean
bean porridge
bear (n)
beard
bear-skin
beat
beaten
beauty
beautiful
became
because
bed
bed-room
bee
been
beech
before
beet
beetle
beg
begin
beggar
behave
behind
believe
bell
belong
belt
bench

berries
beside
best
bet (n)
better
between
bib
bicycle
big
bigger
biggest
bill
billet
bind
birch-tree
bird
bird-nest
birth-day
bit (v)
bite (v)
bitter
black (a & v)
black-berry
black-bird
black-board
blacksmith
blade
blanket
blaze
blazing
bled
blind (a & v)
blind-fold
blister (n & v)
blocks
blood
blow (n & v)
blowing
blow-pipe
blue
blue-bird
blue-jay
blunt
board
boat
bobolink
bobs
bob-sleigh
bob-white
body
boil
boiler
boldly
bon-fire
bones
bonnet
book
book-case
boom
boots
border
bore
born
borrow
both
bother
bottle
bottom
bound
bounding
bow
bowels
bowl
bow-wow
box
boy
brace
bracelet
braid
brake
brake-man
branch
brass
bread
break
breakfast
breakfast-food
breath
breathe
breathing
breeches
breeze
brick
bridge
broadwalks
broke
broken
broncho
broom
brother
brown-bread
brush
brushes (v)
bubble
bubble-pipe
buck
bucket
buckle (n & v)
buckwheat
bud
buffalo
bugger
buggy
build
building
built
bullet
bull-dog
bumble-bee
bump (n & v)
bumping
bun
bunch
bunched
bunny
burdock
burn
burned
burr
bush
bushel
bushes
bushy
busy
but
butcher
butter
butter-cup
butter-fly
butternut
button (n & v)
button-hole
button-hook
buy
buying
buzz
buzzing
by
by-and-by

C

cab
cab
cabin
cabinet
cackle
cackling
cage
cake
calf
calico
call
calling
came
camera
camp
camp-fire
camphor
can (n & v)
candy
candle
candle-stick
cane
cannon

canoe
cap
captain
car
card
card-case
care
careful
carpenter
carpet
carriage
carrier
carrot
carry
cart
cartridge
case
cast
castoria
castor-oil
cat
catch
catching
caterpillar
caught
Catholic
cattle
cave
cedar
ceiling
cellar
celery
cent
chafing-dish
chain
chair
chance
change
channel
chap
chapel
chapped
charcoal
charge
chariot
chase
check
checkers
check-book
cheese
cherries
chestnuts
chew
chewing
chickens
chiffonier
chip
child
children
chilly
chin
Chinaman
chinese
chip
chipmunk
chirp
Christmas
Christmas-tree
chocolate
choice
choke
choose
chop
chunk
church
churn
cider
cinder
cigar
circus
city
clam
clap
clapping
class
claw
clay
clean
clear
clerk
climb
climbing
clippers
cloak
clock
clog
cloth
clothes
clothes-pins
clothes-line
closet
clouds
cloudy
clover
clover-blossom
club
cluck
clucking
coal
coal-car
coal-man
coal-scuttle
coat
cobbler
cob-web
cocoon
cock
cocked
cocker
coffee
coffee-pot
cog
cold
colder
coldest
collar
color
colored
comb
come
comfort
comfortable
coming
comes
company
companion
conductor
cook
cooked
cooking
cookies
cool
coop
copy
cord
core
cork
corn
corn-cob
corn-flakes
corner
couch
cotton
cough
coughing
could
count
counting
couple (n & v)
coupling
court
cousin
cover (n & v)
cow
cow-boy
cozy
crab
crack
crackers
cranberries
crash
crawl
cream
cream-of-wheat

cried
cricket
cripple
crock
crooked
croquet
cross
cross-gun
crossing
crochet
crouch
crouching
crow
crowd
crowding
crown
crows
crumb
crumple
crust
cry
crying
cub
cucumber
cuff
cuff-button
cunning
cunningest
cup
cupboard
cupfull
curb
cure
curl
curly
currants
curtain
curves
cushion
custard
cut
cutting
cute

D

daddy
dagger
damp
dandy
dandelion
danger
dare
darling
dark
darky
darn
dart
dash
dashing
dashed
dasher
date
daughter
day
daylight
deal
dear
dearly
deep
desk
diamond
dickie
dictate
did
die
died
different
dig
digging
dike
dim
dimple
ding-dong
dining-car
dining-room
dinkey
dinner
dinner-time
dip
dipper
dirt
dirty
dish
dish-pan
dizzy
do
dock
doctor
does
dog
doing
doll
dominoes
done
donkey
door
dot
double
dough
dough-nut
dove
down
down-hill
down-stairs
dozen
drank
draw
drawing
dream (n & v)
dreamed
dress (n & v)
dress-maker
drink (n & v)
drinking
drive
driver
drop (n & v)
dropped
dropping
drug-store
drum (n & v)
drumming
duck
dug
dull
dulled
dump
dumped
dumpling
dust
dusty
Dutch
Dutch Cleanser
Dutchman
dynamite

E

each
ear
early
earth
easily
east
Easter
easy
eat
eaten
eater
egg
egg-beater
either
elastic
elbow
electric
electricity
elephant
elevator
elm-tree
embroider
else
empty
end
ended
enemy

engine
engineer
enough
envelope
errand
escape
escaped
Eskimo
even
ever
every
everything
express
express-office
excuse
eyes

F

face
fact
faculty
fair
fairy
fall
false-face
family
familiar
fan (n & v)
fanning
far
farther
farthest
fast
fastened
faster
fastest
fat
fatter
fattest
farther
faucet
favorite
feather
feeble
feed
feel
feet
fell
fence
ferry-boat
few
fiddle
fiddle-de-dum
field
fig
fight
figures
fill
filled
find
fine
finger
finger-nail
fire
fire-alarm
fire-cracker
fire-engine
fire-man
fire-place
first
fish
fish-hook
fish-line
fishing
fishing-line
fist
fix
fixing
fixed
flag
flames
flannel
flap
flat
flat-iron
flesh
flew
flint
float
floated
flock
flood
floor
flower
flour
fly (n & v)
flying
fog
foggy
fold
folded
followed
following
food
fool
fooling
foolish
foolishness
foot
foot-ball
for
forget
forgotten
forehead
forenoon
fork
fought
found
fountain
fox
foxy
fractious
free
freeze
freezer
freezing
fried
fried-cake
fright
frighten
frightened
frisk
frog
from
front
frost
froze
fruit
fry
frying
full
fullest
fun
funny
fur
furry
furnace

G

gallant
gallop
game
garden
gasoline
gate
gave
gee
gems
gentleman
get
get-up
getting
girl
giraffe
ginger
give
gizzard
glad
glass
gnaw
gnawing
go
goat
gobble

gobbler
going
gold
golden
gone
good
good-bye
good-night
goop
got
gorilla
grackle
graham
graham-bread
grandma
grandpa
grape
grape-juice
grape-vines
grass
grate
gravy
gray
grease
greasy
great
green
grew
grind
grizzley
groceries
ground (n & v)
grow
growl
grown
grunt
grunted
grunting
guard
guess
gull
gulp
gun
gun-barrel
gun-boat
gun-powder
gymnasium

H

ha
hack
had
hair
hair-brush
hair-pin
half
halibut
hall
ham
hammer
hammock
hamper
handfull
handkerchief
hands
hang
hanging
handle
hand-organ
handsome
handy
happen
happened
happy
hard
hardly
harness
has
hat
hatch
hatched
hatchet
have
hay
haystack
he
head
headache
head-guard
head-light
heap
hear
heard
heart
heaven
heavier
heavy
heels
hello
help
hem
hen
her
herd
here
hero
herself
hey-diddle
hiccough
hickory
hid
hide
hiding
hide-and-seek
high
highest
higglety-pigglety
hill
him
himself
hinge
hippopotamus
his
hit
hitch
hitting
hoe
hog
hold
hole
hollow
home
honest
honey
hood
hook
hop (n & v)
hope
hopping
horn
hornet
horse
horse-back
horse-shoe
hose
hot
hotel
house
how
howl
howled
hug (n & v)
hump
hungry
hunt
hunted
hunter
hunting
hurl
hurrah
hurry
hurrying
hurt

I

ice
ice-cold
ice-cream
ice-man
icicle
idea
icy
if
in

inches
indeed
indian
ink
indoors
into
insect
inside
instead
iron (n & v)
ironing
ironing-board
is
it
itches
itself

J

jab
jabber (n & v)
jabberer
jacket
Jack Frost
jack-knife
jam
jammed
Japanese
jail
jaw
jelly
jerk
jingle
jingle-bells
jog
joke
judge
jug
juice
juicy
jump
jumped
jumping
junco
just

K

keep
ker-chug
kettle
key
key-ring
key-chain
kick
kicking
kid
kid-gloves
kids
kill
kind
kings
kindergarten
kindergarten-chair
kite
kitchen
kitty
kittens
kiss (n & v)
knee
knew
knife
knit
knock
knocked
knot
know
knuckle

L

lad
ladder
lady
laid
lake
lamb
lamp
lamp-post
land
landed
lantern
lap, n
lard
large
larger
largest
last
lasted
lasso
latch
latches
late
later
laugh
laughed
laughing
laundry
laundry-man
lawn
lawn-mower
lay
lazy
leaf
leak
leaked
leaking
leather
learn
leave
leaves (v)
led
left
left-handed
leg
leggings
lemon
lemonade
let
letter
lettuce
library
lick
licked
lie
light (n & v & adv.)
lighter
lightning
like (v & a)
lily
limb
line
lion
lip
little
listen
listening
live
living
load (n & v)
loaf
lobster
lock
locket
lonesome
long
longer
longest
look
looked
looking
lose
lost
lot
lot (land)
loud
love (n & v)
loved
loving
low
lower
lump
lumber
lunch

M

ma'am
machine
mad
made

magpie
magazine
mail
mail-man
mail-box
main
main-street
make
making
man
many
ma ma
map
maple
maple-syrup
mar—
marring
married
marble
march (n & v)
mark (n & v)
mat
matter
mattress
match
match-box
may
maybe
me
meadow
meadow-lark
meal
mean
meant
measles
meat
meat-grinder
medicine
meet
meeting
melt
men
mend
merry
merry-go-round
met
miaou
mice
middle
might
mile
milk
milks
milk-bottle
milk-house
milk-man
milk-wagon
mill
miller
mind
mince-pie
mine
minute
minute-man
mittens
miss
Miss
missis
mist
mistake
mister
misty
mocking
mix
mixed
moccasin
mock
mocking
moist
molasses
money
monkey
monster
monstrous
moo
moon
moose
mop (n & v)
mopping
more
morning
mosquito
moss
most
mother
motor
motor-man
mouldy
mountain
mouth
mouthful
mouse
mouse-trap
move
moving
movement
mow
mowing
much
mud
muddy
mud-puddle
mud-turtle
mule
muscle
music
musket
must
my
myself

N

nail (n & v)
naked
name
named
nap
napkin
napkin-ring
narrow
naughty
near
nearer
nearly
neck
need
needle
negro
neither
nest
never
new
news-paper
next
nibbled
nice
nicest
nickle
nigger
night
night-dress
night-gown
no
nobody
noise
none
nonsense
noon
normal
normal school
north
nose
nostril
not
nothing
now
nowhere
nuisance
number
nut

O

oat
oat-field
oat-meal

ocean
of
off
oh
oil
oil-can
old
on
once
onion
only
open
orange (color)
orange (fruit)
organ
other
ouch
ought
our
out
outdoors
outside
oven
over
overalls
on
own
owl
ox
oyster

P

pace
pack (n & v)
packing
package
page
pail
pain
paint
paint-brush
pair
pajamas
pan
pantry
pansy
pants
papa
paper
pare
parrot
parsnip
partridge
party
pass
passed
paste (n & v)
passenger
passenger-car
past
pat
patch
path
patter
paws
pay
pea
peach
peak
peal
pealed
peanut
peanut-butter
pear
peas
peek-a-boo
peck
peel
peep
peg
pen
pencil
pendulum
penny
people
pepper
perceive
perfectly
perhaps
pettyjohn
phoebe (a)
piano
pick
picked
pickle
picnic
picture
pie
piece
pie-man
pie-plant
pig
pigeon
pile (n & v)
pillow
pinch
ping-pong
pink
pipe
pistol
pitcher
pitchfork
place
plant
planted
plate
play (a & v)
played
plaything
please
plough
plug
plymouth-rock
poach
porch
poem
point
pointed (a & v)
possum
poison
poke
pole
policeman
polite
pond
pony
pony-cart
poor
pop
pop-corn
pop-gun
porridge
possess
postal-card
post-office
potato
potato-masher
pound (n & v)
pour
prance
prancer
practice
preacher
president
presume
pretty
price
prick
pricked
prickers
prince
print
printing
prisoner
prunes
pshaw
pudding
puff
pull
pulled
pullet
pump (n & v)
pumped
pumpkin

punch
punched
punching
punish
pup
puppy
purr
purring
push (n & v)
pusher
pussy
pussy-willow
put
putting
putty

Q

quack
quarrel
quarreling
queen
queer
quick
quicker
quickly
quiet
quit
quite

R

rabbit
race
race-horse
rack
racket
radish
raft
rag
rag-man
rail
rail-road
rain
rain-drops
raining
rainy
raise
rake
raking
ram-rod
ran
rascal
raspberry
rattle
rattle-snake
raw
reach
read
ready
real
reception
red
redbreast
register
reindeer
remember
rest
revolver
rhubarb
rib
ribbon
rice
rich
ride (n & v)
rifle
rig
right
ring (n & v)
ripe
ripples
rise
river
road
roar
roaring
rob
robbing
robin
robin-red-breast
rock
rocking
rocking-chair
rogue
roll
roof
room
roost
rooster
root
rope
rose
rotten
rough
round
row
rub
rubbed
rubber
rubber-boots
rubbers
rubbing
rug
run
run down
running
rusty

S

saddle
safety-pin
said
sail (n & v)
sailor
salt
salt-cellar
salt shaker
same
sandals
sand
sand-man
sandwich
sang
sap
sap-bucket
sat
sauce
saucer
savages
save
saw
sawmill
say
scabbard
scald
scalded
scalp
scare
scared
scalding
school
school-bell
school-room
school-house
scissors
scratch
screen
screw
screw-driver
scribble
scrub
sea
sea-weed
seal
search
second
see
seed
seem
seen
sell
sent
set
sew
sewing
shade

shadow
shake
sharp
sharpen
shall
shame
shark
shave
she
shear
shears
sheep
shell
shepherd
shelves
sheet
shield
shine
shiny
shingles
ship
shipwreck
shirt
shock
shoe
shoe-string
shore
shoot
shot
shot-gun
shove
shovel
show
shower
shut
sick
side
side-walk
sift
sill
silly
simple
simply
since
sing
singing
sink (n & v)
sister
sit
sir
skate
skating
skim
skin
skip
skipping
skirt
sky
sky-rocket
slam
slap
sleep
sleeping
sleepy
sleeve
slept
slice
slide
slim
sling
sling-shot
slip
slipped
slippers
slop
slow
smell
smash
small
smile
smoke
smoking
smoky
smooth
smoothed
smoother
smoothest
snail
snake
snap
snare
snatch
snow
snow-ball
sneeze
sneezing
so
soak
soap
soap-dish
socks
soft
soften
soldier
some
somebody
something
sometimes
somewhere
somersault
son
song
soon
sore
sorry
sound
soundly
soup
sour
south
spade
spank
spanked
sparrow
spear (n & v)
speck
specked
spider
spill
spilled
splash
splashed
splendid
spin
spit
spoon
spoonful
spool
spot
spotted
sport
spring
square
squaw
squeal
squirrel
squirm
squirt
squirt-gun
stab
stable
stack
stair
stand (n & v)
standing
stamp
stamps
stake
star
start
started
statute
stay
stayed
steady (a & v)
steam
steam-boat
steam-shovel
steep
steeper
steer
step
stepped
stepping

stick
sticks
sticky
still
stir
stirring
stirrup
stitch
stocking
stocking-cap
stomach
stomach-ache
stole
stone
stood
stoop
stooped
stop
store
stork
storm
stormy
story
stout
stove
struck
straddle
straight
straighten
strap
straw
strawberry
street
street-car
stretch
stretched
stretcher
strike
string
string (v)
strip
stripe
strong
stronger
strongest
struck
stub
stubbed
stuck
student
study (n & v)
studying
stuff (n & v)
stuffed
stuffing (n & v)
stumble
stumbling
stump
such
suck
sugar
suit
suit-case
summer
sun
sunny
sunk
sunshine
supper
suppose
supporter
sure
surely
surprise
surprised
surrender
swallow
sweat
sweater
sweet
sweeter
sweetest
sweep
swim
swimmer
swing (n & v)
swinging
swift
swifter
swiftest
switch
switching
sword
syringe

T

table
table-cloth
tail
take
taken
talk
talking
tall
taller
tallest
tank
taste (n & v)
tasting
tea
teacher
tea-kettle
tea-spoon
team
tear (n & v)
tease
teeth
teddy-bear
telegraph-pole
telephone (n & v)
tells
telling
tennis
tennis-ball
tennis-court
tent
terrible
than
thank
that
thaw
the
them
then
there
thermometer
these
they
thills
thing
thin
think
thinking
thinner
this
those
thought
thousand
thread
throat
through
thumb
thunder
tickle
tie
tiger
tight
time
tin
tin-cup
tip
tip-toe
tipped
tired
to
toad
toboggan
to-day
toe
toe-nail
together
toilet
told
to-morrow

tomahawk
tomato
tongue
to-night
tonsils
too
tool
took
toot-toot
tooth
tooth-brush
tooth-paste
tooth-pick
top
topple
torn
tore
toss
touch
tough
tow
towel
tower
town
towards
toy
track
train
trade
trap
tray
tree
trick
tried
trigger
trim
trimmed
trip
trolley
trot
trucks
trumpet
trunk
try
trying
tub
tube
tug
tumble
tumbled
tunnel
turn
turned
turnover
turkey
turpentine
twice
typewriter

U

umbrella
unbuckle
unbutton
uncle
under
understand
unfasten
underneath
underwear
unfastening
undress
unlock
unload
unroll
until
union-suit
university
up
upset
up-stairs
upon
upper
us
use
used
usually

V

velvet
vest
very
villain
vine
vinegar
violet
visit (n & v)
visiting
voice

W

wad
waddle
wade
wag
wagon
waist
wake
waked-up
walk (n & v)
walking
walked
wall
want
wanted
war
warrior
warm
was
wash
washing
wash-woman
wash-cloth
waste
watch (n & v)
watched
water
water-wheel
waved
way
we
weak
wear
weave
web
weed
week
weigh
welcome
well (n & adv.)
went
were
wet (v & a)
whack
whale
what
wheat
wheel
wheel-barrow
when
where
which
while
whip (n & v)
whisper
whistle
white
who
whoa
whole
why
wide
wider
wigwam
wild
wild-cat
will
willow
wind
wind-mill
window
window-sill
wing
wink
winter

wipe
wire
wire-pinchers
wish
wishing
witch
with
woke
wolf
woman
wonder
wondering
wood
wood-pecker
wood-chuck
woolen
woolen-mill
word
work (n & v)
world
worm
worn
worst
worth
would
wound (n & v)
wounded
wreck
wrecked
wren
wrist
write
wriggle
wrinkle
wrinkle (v)
wrong
wrote
written

Y

yard
yawn
yawning
year
yeast
yell
yellow
yes
yesterday
yet
you
your
yourself

Z

zebra
zipping

WORDS BETWEEN FOUR AND SIX.

A

accident
accidental
according
acre
acting (n)
actor
adder-tongue
address
airship
aluminum
American
ambulance
anchor
angel
anger
angle
angry
ankle
annoy
anything
anvil
apart
appetite
apple-blossom
arch
argue
astonished
ashes
ash-pile
awfully
audience
auger

B

backward
baggage
baggage-car
balance
bandage
bargain
barefooted
basement
bashful
battering-ram
bear (v)
beast
beef-steak
bedding
being
bellows
belly
bend
bent
bet (v)
birch (a & n)
birch-bark
biscuit
bite (n)
bit (n)
bittern
bison
blame (n & v)
blank
bleed
blossom
blouse
blue-heron
boat-house
bolt
boss
bow (v)
boy-scout
brads
brains
brake
brave
braver
bravest
bridle
brim
British (n & a)
broth
brow
bundle
bureau
burnt
burst
buried
bury

C

cabbage
calendar
camel
canal
canvas
capitol
captive
capture
carnation
cartoon
catalogue
cat-bird
cavalry
cavern
cement
cemetery
center

certain
chalk
challenge
champion
cheap
chess
chess-men
chicory
chrysalis
chimpanzee
chopped
chorus
cinnamon
circle
clamp
cleat
click
clinch
close (v)
closely
closing
clown
clumsy
coach
coaster
coax
cocoa
cocoa-nut
cod-fish
coke
colander
collect
colt
college
collision
comet
comical
commode
compare
compass
complain
complaining
completely
comrades
concentric
concert
cone
connect
conqueror
contradict
coddle
contrary
copper
copy
coral
cork-screw
corn-starch
coronation
corset
corset-cover
costume
cottage
country
course (n)
cow-slip
cracked (v & a)
cradle
crank (n & v)
cram
crashing
crate
cray-fish
crayon
crest
crew
crockery
crocodile
crook
crooked
cross-bow
crossed (adj.)
crossed (v)
crush
cube
cuddle
cuff
current
curving

D

dab
dabble
daffodils
daisy
dam (n)
dam (v)
damage
dance
dangerous
dangle
darken
darkness
daub
dead
deaf
decent
decently
decide
decided
deck
decorate
decoration
deer
defend
defeat
delicious
deliver
demijohn
den
depends
depot
derrick
describe
dessert
destroy
destroying
detective
dew
diamond
dictate
dictionary
digestion
dime
dipper
disappear
dissect
distance
ditch
dive
diver
divide
divided
dodge
dodged
draw
door-mat
door-way
dome
double (adj. & v)
double-quick
dragon
dragon-fly
drank
drawer
dread
dried (adj. & v)
drip
dripping
drunk
drum-major
dry
duchess
dulling
dumb
dumb-bell
dwarf

E

eagle
earl
earn
ear-rings
eaves
eave-trough

echo
edge
elevator
elder-berry
electric-flatiron
embroidery
emperor
encore
entirely
English
enjoy
enjoying
equator
erase
eraser
escalloped
especially
evening
exactly
examine
except
excepting
excursion
excuse (v & n)
execute
executed
exercise
expect
expecting
explodes
exploding
extraordinary

F

factory
faint (a & v)
fainted
fairly
farce
farm
farmer
fasten
fought
favor
feast
fern
fielder
fierce
figures
file (n & v)
finally
finish
fire-escapes
fire-works
fit (n & v)
fitting
five-cent-piece
flag
flag-pole
flash (n & v)
flicker (n & v)
flip
flop
flow
flown
flattened
fluffy
flute
fooled
forest
forgive
forgot
fountain
forth
frame
freight (n & v)
freight-car
freight-house
freight-train
friend
fringe
froth
frozen
funeral
fumes
furniture
fuss

G

game
gaiters
garbage
gargle
garment
garret
gathers
gathering
geese
general
gentle
geography
giant
giggle
gipsey
glance (n & v)
glasses (eye)
glasses (marbles)
glimpse
globe
glove
glue
God
going
gold-fish
gotten
governor
gourd
grade
graduate
grand
grand-father
grand-son
grasshopper
gravel
grape-fruit
greek
Greeks
gridiron
grind
grosbeak
grown
grinding
grumpy
guarantee

H

habit
hail
hail-stones
halt
halter
handcuff
handling
hardware
hare
harm
harp
hate
hawk
hedgehog
heir
helm
helmet
hencoop
heron
hidden
high-school
hippodrome
hilt
hire
history
hive
hoof
hoop
horse-car
horse-power
horse-radish
horrid
hospital
hour
hound
house-keeper
hum
humming-bird

husband
hustle
hydrant

I

ice-cream-soda
ice-house
ice-boat
imagine
impolite
imprison
insect
instance
instead
instrument
interesting
interrupt
interrupted
indian-chief
indian-saddle
infantry
injury
island
ivory

J

jackanapes
janitor
Japan
jar
jealous
jewel
job
joint
joist
journey
jingle
jury

K

kangaroo
katydid
keel
keg
kernel
kerosene
killed
kimona
kindle
kissed
knapsack
kneel-down
knight
knob

L

lace
lame
landscape
lance
language
lap (v)
late
lath
lather
lash
laziness
lead (v & n)
leader
lean
leap
lecture
lend
lessons
level
light-house
lilac
linen
link
litter (n & v)
livery-barn
log
looking-glass
looser
lovely
lucky
lullaby
lung
lying

M

macaroni
machinery
magic
magic-lantern
magnet
magnificent
mahogany
manage
mantel
maple-cream
market
marmalade
mash
mask
mason
massacre
mast
mate
measure
megaphone
melted
member
mention
mermaid
message
messenger
Methodist
microscope
mighty
miner
minister
minnow
mischief
mischievous
mit
mole
monument
moose
motor-cycle
muff
muffin
muffled
mumps
murder
muscle
mussel
museum
mustard
muzzle

N

narrow
nasturtium
native
navy
neat
necktie
necklace
necessary
neighbor
nervous
net
nickel
nigger-toe
nod (n & v)
nook
north-east
north-west
notch
note
notice
nourishment
numbers
nurse
nut-cracker
nutmeg

O

oak (a & n)
oar
oak-tree
obey
officer
oil-cloth
older
old-fashioned

olives
opera
opera-house
orchard
order
ordinary
oriole
ostrich
ostrich-feather
ostrich-egg
outlook
overtake
owner
oxygen

P

pacer
pad
padded
paddle
pailful
painter
palace
pane
panther
parade
paragraph
parasol
parents
pardon
parlor
park
parsley
partly
pasteboard
pasture
pattern
pave
pavement
peacock
pearl
pebble
peddle
pedal
peddler
pell-mell
peppermint
perch
perfume
perform
performer
person
perspiration
petticoat
phonograph
photograph
pie-crust
pig-tail
pilot
pilgrims
pimple
pin-cushion
pincers
pinks
pine-apple
pirate
piston
pitch
pitcher
plague
plagueing
plane
plaid
plain
plainly
plaster
platform
play (n)
playful
pleasant
ploughed
plunge
poet
poison
poker
polar
polish
pollywog
poor
porcupine
position
possibly
potato-bug
pouch
pouched
pout
power
powerful
precious
print
probably
probosis
proboses
protect
protector
protected
protection
Presbyterian
press
pretend
prize
promise (n & v)
psychology
pucker
puddle
pulley
pulse
puncture (n & v)
punishment
purple
purplish
purse
puzzle

Q

quail
quart
quarter
question
quiver
quilt
quoit

R

racket
ragged
rainbow
raisin
rap (n & v)
rapidly
rat
rather
razor
reader (book)
really
reaper
reason
recess
red-hot
refused
refrigerator
regiment
regular
reins
remind
reminded
replace
represent
represented
restaurant
retreat
rhinoceros
rhyme
rid
riddle
right-handed
rinse
rip
rising
roast (n & v)
robber
robe
rocket
rod
roller
roller-skates
rompers

roundish
round-about
rudder
rude
ruffle
rumple
rule
ruler
rumbling
rummage
runners
runners (sled)
runaway
rust

S

saber
sack
safe
safety
safety-pin
sag
sake
salad
salty
salmon
sardines
sash
sassafras
satchel
satisfy
satisfied
satisfactory
scalding
scamp
scallops
scamper
scarf
scheme
scrambled
scold
scoop
scorched
score
scout
Scotch
Scotch-man
scrap
scowl (n & v)
scramble
scream
screamed
screaming
screw (v)
scribbling
scythe
seam
seat
second
secret
self
send
senses
sentinel
separate (a & v)
separator
Sepoys
serenade
sermon
serpent
servant
sewer
shabby
shaving
shawl
shaggy
sharper
sheath
shed
shelter
sherbet
sherbet-glasses
shingle
shiver
shoot (exclamation)
short
shoulder
shrink
sieve
sifter
sight
signal
silk-worm
silver
simple
singer
single
size
skunk
slant
slanting
slate
slaves
slick
sleeper
sleet
slip-knot
slender
slung
smart
smoke-pipe
smoke-stack
smoothly
smudge
snuffle
snag
snug
smuggle
sod
south-east
south-west
spare
sparkling
spat
speckled
spectacles
speech
spinach
spine
spinal-cord
spinning-wheel
split
splinter
spoke
sponge
spout
sprain
spread
sprinkle
sprinkling
sprout
spurted
spy
squash
squawk
squeeze
squint
stack (v)
stage
starch
station
starved
steam-shovel
steal
stem
stiff
sting
strainer
stream
strength
streak
strip
stroll
stupid
sturgeon
stumped
struggled
students
stumbled
sudden
suddenly
sufficient
sun-burned
supposing

surround
swallow (n)
swan
swarm
swat
swear
sweetheart
swell

T

tablet
tack
tackle
tackling
tailor
talker
tan
tangle
tape-measure
tapioca
tar
tardy
target
tarts
tassel
taught
telephone-wire
telescope
tend
tended
tempt
tender
ten-cent-piece
thick
thirsty
thistle
thorn
thrash
thrashing
threw
throw
thrush
thunder-storm
tick
ticket
tidy
tidied
tighten
timber
tingle
tiny
tire
tissue-paper
tit-tat-toe
tobacco
toddle
toll
tone
tongs
tortoise
travel
treasures
tribe
tries
trifle
trillium
trimmings
trolley-car
trouble
trout
trowel
true
truth
tulip
tune
turnip
turtle
twig
twinkle
twine
twins
twitching

U

ugly
umpire
uncouple
underground
undone
uniform
unwind
uphill
upset
urge
useful

V

vaccination
valentine
valley
varnish
vase
vaseline
vegetables
vein
verse
vessel
victory
victorious
violin
vote
voyage

W

wabble
wade
wafer
waiter
walrus
wampum
wand
warts
washboard
watchman
watercolors
watermelon
water-spout
wax
weak
web
web-footed
wedding
whenever
wherever
whetstone
whichever
whew
whine
whiskers
whirlpool
whirlwind
whoever
whooping-cough
wick
wicked
widest
wife
wild-goose
wool
wonderful
wormy
worry
worse
wrap
wrapping
wreath
wrecking
wren
wrestle
wrestler
wrestling

Y

yarn
yard-stick
yolk
yoke
young
younger
youngest

Z

zero
zinc

SUMMARY

a. Total number of words used at four years		2,346
Nouns	1,207	
Verbs	679	
Adjectives	268	
Adverbs	107	
Pronouns	33	
Prepositions	24	
Interjections	19	
Conjunctions and Articles	9	
b. Total number of words acquired between four and six		1,134
Nouns	693	
Verbs	270	
Adjectives	132	
Adverbs	30	
Pronouns	3	
Prepositions	2	
Interjections	2	
Conjunctions	2	
c. Total number of words at six years		3,950
Words at four years	2,346	
Words between four and six	1,134	
Proper nouns	370	
Numerals	100	

No attempt has been made to secure a complete list of proper nouns used prior to and at six. The "370" in the above table represents only those names his parents could recall with certainty that S. had used. It is therefore undoubtedly incomplete. In classifying the words under the different parts of speech it was discovered that at least twenty-five words were used by S. in two or more ways. Words such as yet, while, either, each, etc., have been placed under only one part of speech. The compilers feel certain that counting everything S.'s vocabulary at six was something over four thousand words.

NOTES ON SCHOOL-LIFE HYGIENE*

By GEORGE V. N. DEARBORN,
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The suggestion that most people do not realize the shortcomings of the present school-system needs to be kept constantly in mind. The entire public-school system of the world is defective in many respects, pedagogical, physiological, and medical. For one thing, the child is hurried into school at too early an age. Children should be kept out of the school room altogether until eight years old (see below): Their greater efficiency thereby secured will easily enable them to make up the three lost years and much more of fundamental importance. The school hours and days are too long. The work is too extensive and not intensive enough. The instruction rendered is often defective; only about 10 per cent of the teachers are graduates of normal schools, which means that the instruction is given by amateurs, not by professional teachers. Why trust our children to amateurs? The instruction is given along the lines of tradition rather than in the light of science,—psychology and pedagogy. The pure natural interest of the child is not seized upon as a key to his psychophysical development as much as it should be. So much as a preface.

The particular hygienic points to be considered and kept in mind in these remarks are these: (1), The child must have abundant sleep; (2) abundant outdoor air; (3) much less fatigue than is now usual; (4) abundant and proper food; (5) abundant outdoor exercise and play; (6) entire freedom from care and worry; (7) information regarding sexual matters, and this early in life.

1. *Sleep.* From the point of view of many medical men neither children nor adults get enough natural sleep. The use of tea, tobacco, coffee, cocoa, etc., late in the afternoon, puts off the natural sleep-time an hour or more at least. Watch "Tabby" and "Towser" and see how they sleep and exercise—theirs is a good model of hygienic life in its physiologic aspects. In the early grades children should have eleven hours of sleep daily; and if they take proper, coarse,

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*Remarks made (March, 1913,) to *The Parents' and Teachers' Association,* of Belmont, Massachusetts.

outdoor exercise they will get it, because sleepy at bed-time. In the grammar schools and afterwards ten hours of actual sleep should be the minimum. In the latter half of the high school there should be at least nine hours; say from nine until six, or from ten until seven. Another thing to remember is that when the child is passing through adolescence as much sleep is demanded as in the case of younger children. At the age of puberty the child is under a strain not present at any other time of life; necessarily this demands much sleep. The use of tea and coffee should be forbidden entirely, and the drinking and eating of cocoa and chocolate (they contain alkaloids too) should be vigorously discouraged towards evening, for they are distinctly stimulative and tend to keep children awake or make the sleep they do get light and partly unproductive of its proper recuperating effects. The normal child does best without stimulant of any kind whatever, habitually.

2. *Air.* There should be abundance of natural (outdoor) air indoors as well as out. During waking hours the child should be outdoors practically all the time. Sewell in his suggestive paper in a recent medical journal has given us a study of the effects of outdoor air on the human body—such as the friction of the wind, the moisture in the atmosphere, and the like. The skin is just as much an organ as the liver, the kidney or the arms and legs. One of its minor functions is respiration. In it are found six or eight kinds of sense organs of much importance. The moisture and the temperature of the moving pristine air have an effect which stagnant, artificially warmed and moistened air has mostly failed to give.

Technical educators, hygienists, physical educators, physiologists, and psychologists have strangely enough as yet failed to come together and approve the only ventilation-method known that is satisfactory to our modern ideas about mental work, freedom from fatigue, and tuberculosis—all three (and others) at once. The plan* is so extremely simple, hygienic, and natural, so inexpensive and common-sensible that it "seems too good to be true" in a complex and extravagant world. The notion is: *Open the windows.* This formula is indeed simple and the materials all at hand in every indoor school-room in the world: Systematically and continually open the windows for five minutes or so every half-hour whatever be the weather, and require the children to practice during that time whatever physical exercises may be best adapted to the temperature outside and to the pupils' ages. This practice, of course, in principle is in vogue in many schools (e. g., those of New York City, in part), but nowhere as yet on the efficient scale, with the system, or with the beneficial effects here proposed. The present intent is to suggest its vigorous performance as a routine and important part of the regimen throughout every school-day in the year, as a part of the pupil's training in the several important respects concerned, and with the same enthusiasm and intelligence and originality of adaptation that the really good teacher affords her pupils in other respects.

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* See for a concise statement of this plan and its relations G. V. N. Dearborn: "Certain Physiologic Aspects of School Hygiene," *Education,* xxxi, 1, September, 1910, 34-43.

Mental fatigue would be practically abolished; brain and muscles would derive all the benefits peculiar to frequent vaso-motor rearrangement; abundant real ventilation would be at last secured with natural, moving, living, outdoor air, vital with the essential qualities of the unharmed atmosphere; money enough would be saved in school-building construction to replace the amateur teachers with professionals; eye-strain and general kinesthesia-strain (seen as " the fidgets ") would be avoided; children would become somewhat hardened to sudden changes of temperature and humidity; the toilet-rooms might be visited without disturbance of class-exercises; the pupils would get abundant muscular exercise taken under the least fatiguing conditions; the teachers would keep fresh and at their maximum efficiency. These nine are, perhaps, the most obvious of the benefits related to this plan. The only valid objection (that some children would take cold in very harsh weather in a cold climate) may be readily overcome by an intelligent adaptation of the method or by the segregation of the over-susceptible pupils until their mucous membranes became trained to ordinary outdoor conditions.

No child should sleep, of course, without two windows open every night—no matter what the outdoor circumstances.

This second point, then, is simply this: School-children must have abundant outdoor air indoors and out,—natural moving outdoor air, as nearly as possible under outdoor conditions.

3. *Fatigue.* The third notion is that there should be *less fatigue:* Every research emphasizes very strongly that the conclusion is correct that our school-children are often overfatigued. Certain books because popular give the wrong point of approach entirely. Such books for example as "Little Men" and "Little Women" by their very titles alone have done a lot of harm, for they are large sellers and are found in every public library. They totally misrepresent the nature of the child, for the child is *not* a little man nor a little

woman. The child is different in almost every essential respect from men and women; different not only in mere quantity but in inherent quality.

The essential element of childhood which demands to be constantly kept in mind is undevelopment, immaturity, not merely as to stature and weight and strength, but as to tissue, as to every tissue-cell of the body. This is especially true and important of the nerve-cells: the neurons have not yet developed to their full size and strength. Therefore is it in part that the young child is incapable of training in the mental sense. It is quite impossible to physically train a child as a man may be trained to do things until he is 16 to 18 years old—largely because the muscle and other cells making up his body are not yet fully developed, but also because he lacks some of the chemical substances (hormones) necessary for the development of various parts of his body, a lack, of course, not apparent to observation, but now beginning to be understood. It is chiefly owing to this undeveloped condition of the billions of cells making up the child's body that the whole child fatigues so easily; and the teacher has always overestimated the strength of the child. The injuries of over-fatigue are cumulative; just as are the injuries from the continuous use of alcohol. A man can go on taking a drink or two of whiskey for months, and in some cases years, and not know that any injury has resulted; and then awake some morning, so to say, to find himself permanently disabled: his heart-action crippled, or his nerve-centers permanently diseased. So it distinctly is with fatigue. The child may run along with a small amount of over-fatigue each day for years and no result be apparent, perhaps, except in times of special stress and strain. Later on in life, however, in misfortune in some depressing illness, such as typhoid or pneumonia, in which the grown child needs a little surplus of nervous energy, he finds that he has not only no surplus to draw upon, but shows every sign of having a deficit of nerve-strength compared with the normal person. He has been working along below the standard of efficiency which would have been possible to him but for the over-fatigue of childhood which had prevented the proper development of the nerve-centers and cells. In all the different researches made in America, Europe, and Japan as to the effect of fatigue, the results were convincing. In school-work the fatigue always was measurable and considerable and the results cannot be doubted: namely, that our present school system is unduly fatiguing.

The practical point of the whole matter for immediate remedy is that study out of school before the age of fifteen is entirely wrong from the physiological point of view. It is one of the defects of our school-system that children are allowed to study at their homes before that age. After about that time there is no reason why they should not do so to some extent. But if a school-system cannot teach a child what is necessary to be taught during five or six hours of the school day, there is something wrong about it. The fact that it is allowed betrays the general ignorance of childhood's nature in the first place, and the common lack of intensive efficiency in our school system in the seond place. Prof. Berle of Tufts College has recently demonstrated the possibilities of intensive home-training, as his important little book relates. He shows how a child can be taught important things more intensively, that is, without spending so much misused time and routine effort. The Sidis system, so-called, and the Montessori system are directed along this same line—many such streams showing that we are spending too much time about our school system and not pushing hard enough in the thoughtful way meanwhile. School is, I repeat, for emphasis, too extensive and not sufficiently intensive. The quality of the study and not its quantity is the one important thing. The object of the school should be to teach the children how to think and become efficient and self-reliant and not merely how to accumulate more or less miscellaneous facts. Interested attention certainly affects the mind more usefully than any other mental means. It is the focus-power of the mind at its best. The child often acquires a great deal more mental efficiency from what he gets without knowing he is getting it, so to say, than he gets by the active, extensive study of books. And much of this more important part of the childhood education he will get outside of school if he has the right seeds of interest put into his mind during school hours.

Aside from all extraneous matters (expediency, convenience, etc.), it would undoubtedly be to the great advantage of the average child's ultimate welfare if he went to school for the first time during his ninth year. It remains for some genius-pedagogue to reconcile the diverse interests; meanwhile the actual child is not getting the best out of his developmental youth. The great chorus of parental voices asks, *What* shall we do with our children before the age of eight, if they should not be allowed to go to school till then? This matter of school-age, then, is distinctly and emphatically a matter of expediency: a matter of practical expediency and not of theoretical desirability. The average parent wants to get rid of the young child for a few hours each day, and the teacher is willing to help. This is not a theoretical condition at all. The theoretical aspiration is to let the child run loose on a farm until eight or nine years old. Then one sees how rapidly he makes up by his greater efficiency in the acquisition of knowledge,—for he has a sound nervous system! As to children in the cities, strike a "happy medium" and have them go to school after the sixth year or seventh. There is always a golden mean. The "social life of the school" to the child under eight is not of sufficient advantage to offset the loss of nerve-building outdoor life.

On the Montessori-Berle plan the average child will learn to read and write long before eight years old if surrounded with people of average intelligence who are at all interested in him. My discussion is purely theoretical, as physiologist and psychologist, and as such my opinion is in the direction that the child much more than makes up mentally what schooling he has lost by beginning at eight or nine, and so far as his body is concerned he has obviously the great advantage, and mind and body are one. That is the ideal condition and may not always be practicable,—until the great light comes! Of course it would depend partly on what was done at school. Much outdoor work in gardens and nature-work and manual training would be distinctly in the right direction and in the nature of a compromise, looking toward the advantages of the ideal outdoor-life plan.

The broad general principles of the Montessori method is going to do great things and modify our school system. When applied in a large, rational outdoor way, the way we Americans believe in, it will assuredly have a good deal of influence on our American school system, for it contains some of the important essentials of the most advanced psychophysiology on which the pedagogy of the future must rest. We should take especial interest in this system because much of its "material" was devised by Edward Seguin and used in the education of the feeble-minded here in Massachusetts many years ago, as a brief visit to the sense-education department of the State School will promptly demonstrate. Since then Doctor Fernald has greatly developed this important system of education, and Maria Montessori has given it wide publicity.

Another thing that should be noticed by parents as well as teachers is the use of vacations. They should be absolute holidays. The essence of a holiday (Saleeby) is freedom from care. Yet some teachers take especial, almost fiendish, delight in giving out a lesson for a vacation to be ready at the beginning of the next unpleasant entertainment she has to offer. This is more than an unkindness to any child, for it not only spoils the lesson but impairs the vacation as well. The vacation should be an absolute outdoor holiday whether it be three or four months or one day in length. The essential of it should be freedom from care. Mixing study and play spoils both.

This whole matter of fatigue is an extremely important one, but the phase of it I wish to drive home and impress is the ever imminent danger of over-fatigue. Because children do not appear fatigued is no sign that they are not so. Because the girl, urged on by youth, does not appear exhausted, is no token that her essential nerve-cells are not seriously fatigued. The child has such an effective surplus of energy that its obvious exhaustion day after day would mean nothing short of lasting physical incapacity. A good healthy, active boy who feels dead tired in a *nervous* way every night is inclined toward an early breakdown. And from abundant knowledge on this subject I assure you that the average school child, and especially the over-conscientious school children, usually girls, are over-fatigued after a few weeks of school. Lessons should not be given out to be done in the evening or over Sunday until the pupil is developed enough to have nerve-cells developed to almost the adult condition of size and vigor.

4. *Food.* The fourth suggestion is that there must be *abundant and proper food.* The only food-principle that replaces worn out tissue is what is known as protein. This is commonly thought to be contained chiefly in meats, but not only meats contain it in an easily available form, for many vegetables, especially peas and beans, contain proteid in large amount. It is especially important that the growing child should have a sufficient amount of protein food, preferably from both fresh meat and vegetables. Furthermore, he should have an abundance of fat, vegetable or animal. These are the main suggestions, short and simple enough, that I have to offer in the dietetic direction. Perhaps the average child, and adult, too, does not eat enough fat. A large amount of this alimentary principle is necessary to proper nourishment and replenishment of the nerve cells of the brain and spinal cord. These get their nourishment from a substance (chromatin) which is partly protein and partly fat, a body of the class called lipoids.

No one, hardly, ever knew of a grouchy fat man; it is a matter almost proverbial that all fat people are good natured. And in that good nature there is not only something pleasant to meet with and have in the family, but it is one of the very most important things underlying plenty of ease in acquiring knowledge, in learning. You do only with a great waste of energy what you do not enjoy doing.

So long as the child is growing in stature, then, he should have an abundance of protein and of fat. Carbohydrates should likewise be in quantity: these are the sugars and starches. The essential muscles cannot work without sugar. They live chiefly on sugar. The child requires sugar just as certainly as sunlight and fresh air. The only exception to the use of sugar by children is eating between meals. If the boy or girl has a well developed outdoor appetite, derived from gross muscular exercise, a slice of bread and butter will taste just as good as cake or pastry or anything else that is sweet. The great armies of the world are now furnished candy as a matter of the ordinary ration. (Queen Victoria a year or two before she died sent half a pound of sweet chocolate to every British soldier in South Africa, and the boxes you will find scattered all over the world today in the homes of Britons treasured like a family heirloom.) Candy of various kinds is served in quantities to every army as part of its regular ration. This is because they have to do a large amount of muscular work in walking, etc., all of which demands sugar to provide the energy as well as protein to restore the worn-out tissue.

School-children should drink a large amount of water, a much larger amount than the average child is inclined to take without impulsion. The regular practice of this habit supplies water to flush out and keep cleaner the digestive tract and tends to keep the kidneys and the skin in good condition. It is an advantage to drink a large amount of water with the meals, as well as between meals, with one important proviso: The child is apt to take a big mouthful of food and then wash it down with a big mouthful of water without the formality of mastication. Guard against this one bad habit and see that there is thorough mastication of the food, and I can assure you on general authority that a considerable amount of water with the meals is an advantage in every way. It makes the food more enjoyed and is "to the good" in other ways. They used to think that the stomach was a closed bag secreting a certain amount of gastric juice and that therefore if you drank water it would promptly mix with it and so dilute it that indigestion would result. To-day we know in the first place that ultimate digestion is rather more intestinal than gastric, and moreover that if you drink a pint of water, in a very few minutes it will be in the intestines and in another short interval in the blood itself. It does not come into much contact with the gastric juice or the secluded glands secreting it. Therefore have the children drink more water at and between meals!

Amount of food: There is less need to speak of that in a well-to-do community, certainly not the need there is in parts of all large cities. No child should ever have less than 70 calories per kilogram of his body-weight: that is the technical dietetic standard for growing children. (Infants below school age should have at least 90 calories.) Today you can readily figure out the fuel-value of foods in terms of the common measures,—an ordinary glass of milk is worth so many calories, a usual portion of butter so much, etc., etc. A little care would enable any parent or teacher to estimate the food-value of all the nutrients the child eats. But no one but an ultra-scientific parent would do it; and I would not want them to, simply because it is usually unnecessary.

School children should eat an abundance of easily digestible food rather often. Children should eat on some other plan than the boa-constrictor method. (The boa-constrictor, it is said, eats one meal every six months and then sleeps more or less until the next meal-time.) They should always have breakfast. In the great cities it is a rather common experience to see school-children who have had nothing substantial: the child will eat a banana or something that "fills," but which as fuel is worth only a few calories, practically valueless as physiological food. You should give the pupil a good substantial breakfast, including something that is "warming." Aside from poverty and parental ignorance it is, even among children, in some cases, quite a fad to go without breakfast altogether; the simple truth of this matter is that the people who adhere to this eat their breakfast the night before. The child, of course, should have the biggest meal in the middle of the day, that is, assuming that you have only one session of school and that the child has come home about 1 o'clock for the rest of the day. Of course it is true that for some time after a hearty meal free intellectual work is impossible, and so this advice would not apply where there is an afternoon session. But if possible, the school-child should have dinner when he comes home from school and not at night, especially when children are left free to eat then some things they should not be permitted to eat. It does not put a child in the best condition to sleep if the heavy meal is at night; on the other hand muscular exercise afterwards does not interfere with digestion. To my mind the ideal school-session would extend from 8:30 to 12:30 or from 9:00 to 1:00, with a recess of an half-hour, or even three-quarters, midway. Fatigue would then be minimized, dinner at the right time, and the afternoon be free for the indispensable exercise and play out of doors until supper-time.

Coffee, tea, chocolate, and cocoa I have already referred to. There is no notion that cocoa at breakfast will hurt any child, but at lunch it is apt to keep him from sleep and should never be used in any considerable strength within three or four hours of bed-time.

5. *Exercise.* The next hygienic point to be suggested in this more or less fortuitous series is *a great amount of muscular exercise.* An abundance outdoors is needed. The kind of exercise the child needs is *gross* exercise,—exercise which requires no mental strain, no nerve-strain, and which employs the gross muscles. Walking and running, climbing, etc., are the ideal forms of exercise; for they use two or three times the amount of muscle-tissue that any other kind of exercise uses. Unless the child be mentally overworked, the inherent and all-important impulse to activity will insure this indispensable adequacy of outdoor exercise. If the child is healthy and normal, instinct will see to it that he gets plenty of gross muscular exercise up to the age of eighteen or twenty, if he has the chance, spatial and temporal.

One thing of which it is no use to talk, but which should be forever remembered is *country-life.* Country-life is the only physiologic child's life. The cry of "back to the farm," "close to nature," "next to the ground," or any other of the numerous similarly slangy expressions which mean so very much for the good of the child and the future generations, should not be lightly dismissed. Those children brought up in places where there is plenty of room and abundant outdoor time are extremely fortunate. This is one of the greatest problems of the future. The trolleys, telephone, electricity, moving-pictures, libraries, parcel-post are beginning to solve that great problem. They and other things are rapidly making country-life more and more attractive, and before you know it the abandoned farms will all be gone and then who knows but what there will be tenements to let in the cities' crowded districts!

6. *Freedom from care and worry.* Childhood is the carefree period of life. None the less a good many conscientious children do worry in school-time, although they do not make it so manifest as the old-maid aunt or the over-worked, dependent father. They worry about their lessons and all sorts of things related thereto. Education should *not* worry them. If their education is to be of any use, it should be in the main attractive and absolutely without any possible element of worry. You cannot expect the child to sleep well, for example, who has worry on his mind.* The education of the

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*See the present writer's recent "Nerve-Waste," Booklet, No. 27, in the series published by the Health-Education League, Boston.

mind, as well as that of the body, as the physiologist sees it, should be an attractive process, free of all worry. The chief objection to attractive education, as some think of it, is that it lessens the vigor of mental training. That is not of necessity at all true. A sufficiently skilled board of teachers could devise an educational system that would be attractive and even somewhat pleasurable to the child and at the same time have in it any amount of desirable mental training and discipline. These two things (attractiveness and training) are not inherently exclusive; the idea that they are so comes from the old notion of the continual use of the rod, and thinks of discipline as mostly dependent on punishment. I maintain that a professionally skilled teacher will make education at once attractive and give it plenty of physical and mental discipline too. The mental training should be included in the attractive education. Recently various writers have emphasized by research the various degrees of efficiency with which people do things when they enjoy or dislike doing it. For example, the well-known research by Professor Book on the acquirement of skill on the typewriter. He convinced himself that on what are called "off-days," when the individual did not enjoy his work or practice, he made no *advance* whatever in learning, he did not *increase* his skill any or improve his speed or his technique or accuracy; there was no advance on those days in which the individual did not "feel like" doing the work. The moral of this important research is not that we must stop routine work when it is not pleasant, but that we must not try to do extremely difficult and new things when we do not enjoy it. Artists of all kinds discovered that many years ago. No artist thinks of composing on a novel, or a piece of music, or doing original work on a painting or statue when he is feeling out of sorts and does not really wish to do it. He will go away for a month or a year and then come home and, for example, paint a picture in a week which he can sell for more than one a drudge could paint in six months.

It remains for the school-system to adopt this important method of the artist, or to rediscover it anew and apply to the high purpose of education. Education should be made more attractive. You should not expect children to carry on with true success this extremely complicated process of learning something unless the work be presented in such a way as to be pleasant to them. That which is pleasant is usually interesting,—and *vice versa*. You may take a boy to school and "punish" him and so make him study after a fashion, but it is at a great *extravagance* of nerve-strength. Joy is the birth-right of every child; and moreover the child's efficiency is greatly increased by letting him be joyous. Happiness, like honesty, is the best policy as well as the best experience in general that we can get out of life. It is not only "the greatest thing in the world," but it is the best "business," for it gives you the greatest index of efficiency that is possible.*

An element of this matter too often ignored by parents as well as teachers, is encouragement. Certainly children do not get enough encouragement from their parents, and commonly none from their teachers. The parents may leave it to the teacher and the teacher leaves it to the parent—with the inevitable result that the child does not get encouragement at all. Specific encouragement as to the details of his work is needed by every child.

7. *Sexual enlightenment.* It is more than high time that this subject *were* in the air, as it is to some extent today. There is great need for sane enlightenment on sexual matters; that is, knowledge of the theory of love in the minds of growing (as of adult) people. The average parent still believes that sexual ideas and feelings and curiosity do not develop much until puberty. That is not true. We now realize (Freud) that the child usually gets curious about sexual matters when he or she is from eight to ten years of age, if not earlier. This is purely intellectual curiosity and not much based on physiological conditions. It is purely ideal or intellectual curiosity, curiosity to know where babies come from, just as there is curiosity to know what is on the other side of the moon or why the rain comes. This sort of curiosity can be and should be satisfied when it appears, and by the parents.

The important psychological reason why the child should be gratified in this is because satisfaction drives the curiosity out of the mind. Explain to an active boy how a machine works and he will be more apt to stop thinking about it—his impulsive curiosity is gone, but unless you do satisfy this sexual curiosity early, it *remains* and works subconsciously and may work to the child's disadvantage. This is sound psychophysiology. These perfectly natural and inevitable ideas arising about the age of ten, or even years earlier in an inquiring mind, are clearly and purely scientific and when explained will tend to disappear until the time of puberty. Then they become instinctive and you cannot and do not wish to make them disappear, and the enlightenment then must be in an adult fashion and in a more complete way. Before puberty there is nothing of necessity especially interesting about sexual matters until they grow into the overwhelming sexual instinct. Schools of eugenics are being started. A pioneer school has just been started in Boston by Doctor Evangeline W. Young, and bids fair to become a valuable institution, for it is a school where teachers and parents and social workers can be enlightened on all the scientific phases of sexual matters. And there are plenty of things yet to be worked out. The details are rather difficult, but no one is going to admit that so tremendous and important a matter cannot be solved to the solid and lasting satisfaction of all concerned, born and unborn. The so-called social evil is one of the tremendous crimes and scandals of civilization, and this "great enlightenment" is in my opinion the only practical way to hold it in check: actual definite knowledge on the part of every one, just as every one knows the ill effects of alcohol and of the excessive use of tobacco or other drugs.

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* This whole matter is discussed in G. V. N. Dearborn: "The Sthenic Index in Education," *Pedagogical Seminary,* xix, 2, June 1912, pp. 166-185.

There is a real need to call attention to these educational dangers arising everywhere chiefly because the average teacher and the average parent do not realize that the nature of the child is different from that of the adult. Our children are not indeed young men and little women, far from it: they are different in every way and it is time that all persons concerned realize this truly important fact.

The science of child-physiology strangely enough, has not yet been born, while that of child-psychology is still in its early infancy. When these two sciences have developed somewhat into a real competency and have been adequately applied to education, we shall see a tremendous benefit not only in the efficiency of our schools as a working machine, but in the happiness and usefulness of their product:—the contented and prosperous *family,* knowing well, parents and children both, how to prosper. Our children are decreasing in number largely on the plea that the few will have a better chance,—is it not time now seriously to consider, all of us together (parents, teachers, and scientists), why this better chance is not coming to them in larger measure? For the children are everything.

MOOD IN MONOLOGUE

By Thomas P. Bailey, Ph. D.

Although little is now heard in a popular way about that " child study " which was so much in vogue some years ago, the scientific study of the mind has received a stimulus and an impress from child-study that it will, let us hope, never lose. Psychogenetic studies and the psychogenetic point of view are well established facts in contemporary psychology. When the greatly to be desired practical science of character, John Stuart Mill's "ethology," shall take on vigorous and productive life, we shall probably find that child-study, chastened and scientific, will prove to be its most important source of material. And by no means the least important phase of the study of children will be a microscopically careful investigation of typical or concrete-generic bits of naïve childish life just as and just when they normally occur. Sometimes it happens, especially in matters of human nature, that a combined "coarse-adjustment" and "fine-adjustment" study of a single typical case will prove more suggestive than an attempt at a more pretentious inductive treatment of large masses of material drawn from divers sources and hence put out of that personal human setting so important in "embryological" study of character.

The following little sketch has at least the merit of presenting the material substantially as it occurred, and its "story" was recorded within fifteen minutes of the event. Moreover, the recorder, realising the importance of photographic accuracy, conned his lesson as it proceeded so as to give as nearly as possible the child's *ipsissima verba,* paragraphing and expressive signs. Trivial as such an exercise of alternating attention may seem to the uninitiated, no man who has undertaken to make a moving-picture show of his mind, to keep track of the story being exhibited, to watch the apparatus, the audience and himself,—I say that no man who has tried that kind of thing will be ignorant of what " strained (and trained?) attention " means!

I

The father of the family is enjoying his pipe and the cool of the evening after supper, and his mind reverts to a psychological theme that had held his attention a few hours before. The four-year-old girl, B. L. N., quietly slips out to the veranda from the supper-table; takes her seat on her father's knee, without asking leave, and nestles close against him. Her eyes are wide open as she gazes alertly into the thick foliage dimly lighted by the pale moonshine that filters through thin clouds. She begins to prattle in a low tone, but at first the father pays little attention and strives to continue his psychologising. After a while his attention is caught by the rhythmic swing of her speech and the regularly repeated formula of her conditional sentences. Her *ifs* seem to be expressive of imaginary anticipations. It has been said that "the impulse to poetry is the instinct to express mood." "This child is certainly expressing a mood," says the father to himself, and is coming as near to spontaneous poetry as she can with her prosaic little brain. So with her brook-song of prattle the little one makes her elder stand still, like the wedding-guest in the "Ancient Mariner," and listen to her tale.

"Papa, if a mad-dog came at me you could kill it—wiv (with) your gun—couldn't you? (Mh-hm). Papa, a mad-dog can't climb a tsee (tree), can it? It's too slicky, isn't it? If a mad-dog comes at me I can jump on it and it can't hurt me, can it? (Faint demur.) Papa it wouldn't hurt a little baby, would it?

Papa, if a rabbit came at me and I would lie down, it wouldn't hurt me, would it? It wouldn't hurt a baby, would it?

Papa, I dreamed about a big-fat calf that came at me on the concrete sidewalk, but I and Claudia took James' hand and wan-away and it couldn't hurt me. It couldn't hurt a big-fat boy like you, could it? (The "big-fat boy" is forty-two years old, is over six feet high and weighs less than a hundred and thirty-five pounds!)

Papa, if bad fings came at me the angels wouldn't let 'em hurt me, would they? *God* wouldn't let them. *He* sees.

Papa, if a big-fat lion came at me, you wouldn't let it hurt your baby, would you?—Papa, we used to call you *father;* but we don't now, do we? (The grown-ups used to coax her to say "fader.") I was a little baby once and had all I wanted to eat—milk—and all I wanted to eat. But I'm a *big* girl *now.*

Papa, bad fings can't hurt a big girl, can they? A mad-dog can't hurt a big girl, can it?

Papa, once a mad-dog tried to get me and I went up a tsee (tree) . . . . ."—Here follows a dramatic recital, fabricated out of hand, at the end of which an interruption occurred.

II

A few notes may make the child's stream of talk more significant. The "mad-dog" is a symbol of danger traditional with the child's brothers and sister. Moreover, very frequently stray dogs pass close to the house and usually elicit some exclamation of the "get out of here" order from some member of the family. Hence the child probably expects to see a dog. If so, only the "mad-dog" will suit time, place and mood. B. L. N. has climbed trees and found them to be "slicky" at times, especially when she has her shoes on. The thought of jumping on the dog is like unto the old Esopian fable of *"Hoedus stans in tecto domûs lupo praeterunti maledicit."* When her father shows disapproval of this suggestion, she takes refuge in the concept of her defenceless babyhood that ought to be safe from all untoward occurrences.

The second figure of what is probably a slight mood of fear, is the rabbit, who probably takes color from the enhanced personality of Uncle Remus's astute hero. The rabbit *might* hurt, but won't.

The "big-fat" calf is an idealisation of a dream-calf previously characterised simply as calf, whose prototype was probably little and lean. Of course we ought all to make our dreams interesting and dramatic!

Starting with a real dog of partly mythical attributes, she proceeds to a literary rabbit, and then to a dreamland calf. Here is ample material for "supposin'"! At this stage she gets closer to the land of fears, and bolsters up her confidence in her near-by protector by her unconsciously sardonic remark about the "big-fat boy." Of course that calf was only one of the many "bad fings" that come in dreams. And, equally, of course, all well regulated households of children know that angels are the natural and supernatural foes of "bad fings," and that "God" is the chief of the angels, perhaps the "biggest-fattest" of them all! But, as her nine-year-old brother would say, "God won't mind her calling Him that, will He, Papa?" Now be it known unto all men that know children: the lion is one of the chiefs of "bad-fings." In lieu of more spiritual aid, Papa will have to serve as a more or less tangible substitute for more effective help. Perhaps her references to her father may be connected with the thought of God as Father, a piece of teaching recently given her at Sunday School.

The pathetic reference to the baby whose diet was so strictly limited in quality but so gloriously unlimited in quantity may be due to the daily necessity of restraining the young hopeful's over-specialization in the devouring of whole-wheat and graham biscuits. Indeed, she had just left the table, minus one more biscuit that would have been one too much!

At this stage the little psychoanalyst sits up. The fear-attitude is slowing down; the confidence and protection attitude is rising. And the "big girl" comes on the stage with the recital of an imaginary encounter with a rather spiritless "mad-dog" that can't even climb a "slick tsee."

III

In venturing upon a few psychological comments I am considerably helped by a rather intimate knowledge of the child's character, so far as it has revealed itself. But every psychologist interprets phenomena of the mind from the point of view of his own system. Therefore I have tried to keep the comment as free as possible from interference with the facts themselves. And yet I am strongly inclined to think that the little story and others like it will bear out some of the suggestions that follow.

(1). Here we have a mood that develops from a slightly excited fearsome imagination to one of protection-safety and, finally, make-belief. There is a succession of fear-inspiring images, not taken too seriously, and with salvation from the objects of fear never lost sight of but becoming more assured as the little monologue comes to an end.

(2) The associations strike one as auto-suggestions, eventuating in a sort of catharsis of the vague fear that underlies the mood. Indeed, the child plucks out her scarcely rooted little sorrows, facing the dim scene of ill-understood nature, but from the vantage ground of a father's protecting arms. Her talk is not soliloquy but monologue; for the sense of her father's presence is constant and guides the self-catharsis to a successful issue. I believe that not a few hints about psychoanalysis might be got from the instinctive psychotherapy of childhood. Even the religionists who are practicing mental healing might well get some guidance by studying children's exhibitions of faith and love. Many an adult might copy this child's method of talking herself out of a fear. And, if I am not mistaken, the best psychotherapists try to induce in their patients the habit of self-cleansing from emotional besettings.

(3.) Note the range of the child's associated *experience:* memory images, hearsay, literature, dream, teaching, present reality (nestling in her father's arms), make-believe. The discourse runs from the mood as a centre into all possible lines of association. It sometimes seems to me that the only real consistency and unity in thinking is the product of some affective mood, which may be due to some primitive emotion, at one extreme, or to what I have called elsewhere the "conceptual coenaesthesis," at the other. For mere logical thinking has but a pseudo-consistency compared with the vital unity of a deeply based mood that affects the whole character. The cold, dry light of reason is, after all, the product of a specialized faculty, not of an integrated character. But in order to show forth unity, a mood must be characteristic, like the little child's that we have studied, not pathological. She has no absurd fixed idea and the fear of it—no fear of her fear,—but a confident and limpid self-expression in the presence of a normal social environment in which she knows, and feels that she belongs.

(4). *Association* by *congruity* (similarity) is seen in the list of beings that are imaged more or less clearly. The class "bad fings" is divided into mad-dogs, big-fat calves, etc. The class of good things includes brother and father as well as God and the angels. There is mood congruity and relational congruity as well as mere association. Her *continuity* associations are manifested by her use of personal experience, dreams, reference to her babyhood, stories heard, "big girl," etc. Association by *community* is shown not only by her conference with "Papa," but also by her tendency to draw him into touch with her experiences. And these modes of association are three-in-one, not three. For in any typical sentence all three aspects are to be seen, forming a synthetic unity that is far from being merely mechanical.

(5). Such episodes as "We called you father," "When I was a little baby," etc., testify to some degree of self-conscious reminiscence. She chuckled a little when telling of the time when the children called "Papa" *father*. The chuckle can't be written out, but it was meditative. Here again we find the vitality of a genuine normal mood, rather than a lot of mechanical associations more or less interrupted by emotional explosions. We may come some day to a better psychological realisation of what it means to be "like unto a little child."

(6). Practically all the most useful and usual relations and categories of everyday thought are to be found in the little monologue: For instance; space, time, number, part and whole, cause and effect, means and end, reference, significance, control. We could get along pretty well in the mental life with these nine categories only.

(7). The child's philosophy might be summed up in these simple judgments: Bad things are threatening, but can be stopped or mollified; little girls are protected; big people need no protection; when children get big they are no longer afraid of bad things. Doubtless more than this is involved in the philosophy of the mood, but I think that at least this much is implied.

(8). A child's thought may be far more complex and perfect than many take it to be. The first study of a child that the present writer ever made tempted him to agree with certain philosophers and psychologists that a child's failure to use the pronoun *I* at an early stage of his speech-development indicates his lack of self-consciousness. Well, when the second child (a brother of the first) was studied, care was taken to address him always as "you." And the grown folk usually remembered to say *I* rather than *Papa, Mamma,* and the like, when speaking of themselves. Interesting enough, this second child said *I* from the start. If he possesses more self-consciousness or had an earlier development than his brother, no one could detect it. On the contrary, the elder boy is by far more self-conscious, in any sense of the term.

We have already noted the fact that our little subject's thought is organised relationally, is unitarily characteristic and not merely mechanical. Curiously enough, in a previous study* will be found a study of association series of two adults, the parents of B. L. N. The earlier study shows that the adults' associations are very largely mechanical and accidental, whereas the child's we now find to be vitally well organized. The adults' mental processes are lazy and conventional; the child here does all the talking but keeps her head against her father's heart, metaphorically as well as actually. And yet, psychologists keep on drawing their illustrations of mental processes too largely from the experience of adults. True, we run the risk of misinterpretation when we try to analyse a child's thought. But of course we run that risk in the interpretation of our own mental processes. Besides, I am not asking that we cease to introspect—such a procedure would make child-study of no use—but that we should take children's conduct, when it is expressive and naïve as an objective guide to reality in conjunction with our own careful introspection. It is easy to poke fun at "baby-psychology," but a much harder thing to appreciate its value and to take the time and patience and sympathy necessary to get anything worth while out of it.

(9). Finally, attention may be called to the kind of mental stuff that hangs together in this little story of the mind. In a previous study* I tried to illustrate what kinds of mental phases "went together," and gave the following as what might be called the *affective grouping:* organic sensation, coenesthetic feeling, imagination, pursuit, anticipation. I believe that the present study of a mood is a capital illustration of a feeling-phase. The child's wriggles at certain climaxes of her story can be inferentially called expressions of *organic thrills.* She assuredly was a little *excited.* *Anticipation* is shown by the whole context and the structure of the "supposin'" or *if* sentences. *Pursuit* is shown in the headlong haste and close trailing of the main mood, and in such vigorous expressions as "climbed a tree," "jump on him," "kill it," and the like. I should say that a typical affective mood ought to include all the just mentioned phases as affective renderings of "intellect, feeling and will," with the pleasure-pain-excitement phase of feeling predominant and coloring the whole mood.

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* Journal of Phil. Psy. and Sci. Methods, Vol. 3, pp. 435-9.

* Jour. of Philosophy, iv., pp. 342ff.

THE CHILDREN AND RELIGION

By John J. Marrinan, Pinkerton Academy, Derry, N. H.

I

Dr. Faunce has said, "The men who sit at the head of the pew on Sunday morning are probably beyond the period when great changes are possible. Why should they wish to remodel a life,—if it were possible for them to do so—remodel a life which the world has honored, or reconstruct a society which has given them wealth, position, influence? They can be strengthened in good resolves already made; they can be comforted in trouble, but their religious education is at an end; their successful career has been the finishing school." There is a wealth of good pedagogy in the foregoing, a pedagogy which repudiates the "never too late to mend" philosophy, and further points the channel through which religious education must proceed if it is to rise above formalism and find its expression in the deeds of men.

In Dr. H. K. Carroll's annual statement of church statistics we learn that the gains in church membership during the year 1912 show a loss of almost one-third in net increase of members as compared with the previous year 1911, and this, notwithstanding the fact that the church has but recently invested over a million dollars and considerable energy in the Men and Religion Movement. The great significance of this fact seems to lie in its testimony of the soundness of that opinion which declares: "We must recruit our Christian army from the ranks of more or less neglected little children. Let us prepare them for the service by offering them the advantages of a pedagogical religious instruction."

Of all civilized nations the United States has but the single ally, France, in the policy of "laissez faire," which this nation in its official capacity feels compelled to manifest toward all matters of religious education. In fact, Protestant, Romanist, and Jewish brothers in this country all unite to support the proposition that the American democracy cannot logically sanction any organic bond between church and state, even though such relationship exist for the sole purpose of guiding a broad scheme of unprejudiced religious education. Here, as in other fields of human endeavor, the results of the centuries of factional and denominational warfare cannot be obliterated in a day. Yet the duty of rearing our young people in surroundings brilliant with the light of the Christ-life, this obligation remains uncancelled in the family, in the community, in the nation. The performance of this duty gives a great promise for the future efficiency of the American Christian Church.

But what criticism can be directed against present-day religious instruction? Why is it that so many of our young people are unhappy or indifferent attendants in the Sunday School? Why does the secular school letter outbid the Sabbath School badge on the playground? Why is the American boy charged with lack of reverence? Why is a clergyman of my acquaintance obliged to use device and pleadings to secure a response in Christian Endeavor service, a response tinged with diffidence and entirely wanting in spontaneity? Why do many of our fellows deem it sufficient to worship at the altar of formalism one day each week? Why are the leaders of a powerful church, seeking Christian morality, complacent in their reliance upon the deterring influence of the appeal to human fears? We must look to a decadent religious pedagogy in answering these questions, a pedagogy born of dogma and of arrogant authority, a pedagogy which has known the man and "the little man," but not the boy.

Perhaps never before in American life has there been so urgent a need for strong educational leadership in the church as there is today, a leadership competent to guide young people safely amid the pitfalls of an environment seething with economic, social, political, even religious unrest. The clergyman of the near future must shoulder this responsibility of Christian educational leadership. Our cleric brother must, like Christ, be a teacher; not a teacher of dogma, doctrine, or of the profundities of theology, as much as a teacher of living Christian precepts; not a sensationalist, not a materialist, but an educational leader who, by word and deed, shall bring his people to a living contact with the highest and best in human life.

What more interesting and fruitful work can there be for a pastor than that which he will find in the great field of religious education? And what a boon it will be to the church, and to the community, to have as spiritual guide a man versed in the training of children, a man who will assemble parents perhaps for a consideration of child hygiene, a leader who will call a sound pedagogy to the task of rekindling the fire of religious life in the home, a minister who not only inspires men to seek the spiritual life, but one who can contribute to the enrichment of the lives of children. Such a clergyman will not place great dependence upon device, revival, conversion. His work will be essentially formative—not reformative. He will proceed with that unwavering certainty of the master builder, and, above the foundation of a completely lived, christian childhood, will raise a structure of vigorous christian manhood.

II

The tendency of the present day seems to be toward a high degree of specialization in all departments of human activity. It would appear that the home of today attends chiefly to providing the material comforts of life, and shifts all educational burdens upon the recognized special educational agencies, the schools. The same tendency manifests itself in the gradual disappearance of that active religious life of the home, which was such a potent influence for good sixty years ago. Indeed the Sunday School of the twentieth century has been generally designated as an educational specialist, and must soon announce the inception of a more efficient religious pedagogy.

However, in recent years American religious education has taken many steps forward. The ascent of psychology and religious pedagogy in the seminary promises much. Then the Sabbath School has been relieved in some measure of the perfunctory methods of the past, graded lessons introduced, expert supervision sought, and teachers trained. The general plan of operations has been to adapt the guiding principles of secular education to use in the Sunday School.

But the church must not rest with merely such progress. The religious school, by virtue of its place of distinctive independence, its freedom from the slow-moving and frequently complicated machinery of public instruction, has an opportunity to eclipse the secular institution. It must avoid the errors into which our public schools have fallen; it must attain a level in the world of education which shall be in keeping with the importance of its work. Finally there must be the leadership of a sound pedagogy, making its appeal to human life as we find it in this 20th Century.

Let us turn for the moment to a consideration of the problems to be solved in elevating religious instruction to the level of greater efficiency. Numerous questions suggest themselves. Will the modern Sabbath School be provided with the physical accompaniments which have been proven indispensable to the secular institution? Could there be curricula for religious instruction which would present a natural seqence of biblical subject matter? Is it possible to solve in the near future that disturbing problem of securing additional time for instruction,—perhaps by the arrangement of a mid-week afternoon session? Shall we retain the attractive, fair-haired and blue-eyed good fellow of the neighborhood as teacher, or must he give way to the young man of strong personality, trained for the work? Should there be manual training in religious education? Is the present graded lesson system successful? Shall we have pastoral supervision? How can we make the normal training class a successful unit in every organized religious school?

Such a plan of activities as is suggested by the preceding queries will place a heavy initial expense upon our churches. Furthermore, it calls for a superior ministry, and, doubtless, an educational campaign of this magnitude cannot be thrust upon our congregations in a day. Nevertheless, it will eventually solve the problem of irreverent children, indifferent church support, and empty pews.

Let us consider briefly the guiding principles which must direct religious education. The philosophy of "first the blade, then the ear, then the full corn in the ear," should be a fundamental in both secular and religious education. Twentieth century pedagogy appropriates this significant principle in its declaration that education should not be considered as preparatory to life, but rather should be esteemed as an expression of life itself. The teacher is to help unfold completely a measure of child-life today, thus providing a basis for a full measure of the higher adult life on a future day. The boy of ten is not to be given a pared-down morsel of adult teaching, for he is but a "blade," and is not yet ripe for the harvesting activities of the "full corn in the ear."

A growing consciousness of the importance of this work of religious education, not alone to the church, but to the community, and to the nation, has led many investigators into the field. It has been noted that a large percentage of boys are lost to the church during the years of early adolescence. The conclusion has been drawn that this period between twelve and sixteen years of age is the critical period in the religious education of the boy. As a consequence, much attention has been given to the choice of biblical materials, and to methods of instruction adapted to the needs of the adolescent.

However, is it not possible that a more comprehensive pedagogy will find it desirable to supplement this excellent work by devoting some considerable attention to the roots of the tree of religious life, those roots which are nourished or impoverished according to the measure of pedagogical intelligence employed by parent or teacher during the periods of babyhood and early childhood?

Infancy is the time in the development of the child which demands an instruction rich in romping physical activity and in the exercise of the senses. Here is the foundation upon which all later mental and spiritual attainments are reared. The penalty of disregard is ever that which comes to him who builds his mansion upon the quicksands.

Later, at the age of perhaps six, the old stick personified becomes the prancing steed, and the boy lives in an age of imagery. He imitates, he is curious, and he questions; he talks incessantly, he becomes a nuisance to the unsympathetic parent or teacher. And yet, this is nature's way of laying a ground-work for the proper functioning of a human soul.

Will religious pedagogy take advantage of these divinely implanted impulses which find expression in the spontaneous play-activities of all normal children, and which call forth and direct that vitality which makes possible the growth and development of body, mind and spirit? Will the Sabbath School recognize in these impulses, beacon-lights of God's creation, marking for the teacher, the true channels of normal child activity?

Again can we convince the religious educator that nature deems it necessary that every normal child who comes into the world shall repeat in natural order all the activities which have helped unfold the mind and soul of the race? At three years the boy is a selfish little animal; at nine he lives in a world peopled with heroes; at fourteen he hears the call of the "gang" instinct, and enters upon his social being. Indeed, the boy from birth to manhood is passing through a succession of periods of activity, nascent periods, each period marked by a peculiar responsiveness to characteristic activities, each activity a heritage from the past of the race. Dewey tells us that it is the business of the teacher to seize upon these budding impulses to activity displayed by the child, and to train them until they ripen and pass over into higher endeavors: Activity,—growth, development; Inactivity,—decay, degeneracy.

The kindergarten child learning the geography of Palestine through sand-table work or paper-cutting exercises, the boy of ten years becoming acquainted with Jesus, the hero, the boy of twelve or fourteen associated with his fellow adolescents in the Boy Scout Patrol or in the Agricultural Club,—it is probable that all these are being instructed according to the most approved tenets of present-day educational philosophy.

But the child of eight, seated in the church auditorium, amidst a riot of sense stimuli, and coerced into committing a memory verse, a verse similar perhaps to the following to be found in a Junior Quarterly, "In Him was life, and the life was the light of men," such an unfortunate is sowing—or having sowed for him—the seeds of strong dislike for that which he might be taught to love. This is but another instance of the common practise of administering a dilution of adult philosophy to the "little man."

And yet, a rich fund of appropriate material well adapted to effective teaching is ever available and awaiting but a summons to the work. The teacher of the Bible who has gained even a fair intimacy with the Great Book in its geographical and historical settings, and who appreciates its *use* in religious education, will scorn to take advantage of the deplorable "crutch" possibilities of the Sunday School Lesson Sheet. Such a teacher has at his command a wealth of interesting subject-matter for the babe, the boy, the man, subject-matter which, if rightly presented, will not only swell the stores of human knowledge, but will touch the well-springs of human emotion, and inspire boy and man alike to a participation in the active Christian life.

Let us not be mistaken in the goal of religious instruction. Sometimes it would seem that our teachers deem it sufficient to stock the child with biblical information. Yet have we not seen the precocious Christian of perhaps ten years, adorned with a superficial mask of bible lore, have we not been witness frequently to such a boy's fall at twenty-five into the depths of religious apathy and indifference? The educational institution which is satisfied to measure the efficiency of its work by the "acquirement of information" standard, the religious school whose practise is restricted to formal question and answer methods is contributing little to the life of its children. Indeed, it is under such conditions that "a birth-right is exchanged for a mess of pottage," and souls intended for the activities of noble living are confined to the baser levels of superficiality.

To illustrate, Mr. X. was reared amidst ideals of church attendance and Sunday School honors. The habits of youth were so deeply impressed that today X. attends services faithfully when at home over the week-end. During the six days which really test the depths to which Christianity has reached, Mr. X. is, during play hours, an immoral scoundrel. But in the home community he is still held a model, and as a representative of a leading text-book publishing company he is called successful. His training, as will be noted, has fitted him very well for work in the rural communities where, almost invariably, a clergyman is the dominating influence of the school-board. Mr. X.'s field records enable him to arrive in town on the evening of the prayer-meeting service. He attends, he testifies, his *information* of church and of churchmen makes him a welcome guest of the pastor after service hour. The inevitable happens; he sells a bill of goods; his religious experience has found its expression. Not then merely a knowledge of the forms, procedure, good usage of the church, not the narrative of the Christ-life as the end in religious instruction, but rather a pedagogical use of these wonderful resources in the development of resolute habits of Christian conduct. There is the goal!

Said the Great Teacher, "Suffer little children to come unto me, and forbid them not, for of such is the kingdom of God. Verily I say unto you, whosoever shall not receive the kingdom of God *as a little child* shall in no wise enter therein." Although suggestive of the unfortunate " better than thou " attitude of warring christians, yet is there not a hint of the pedagogy of Jesus in that boast of an eminent Roman Catholic Bishop, "Give me a boy until he has reached seven years, and you may take him,—if you can." And this Romanist brother is interested in the construction and operation of parochial schools. Again is there not a hint of a high-grade religious pedagogy in 1 Cor. 13:11, which in substance is, "When I was a child I spake as a child, I understood as a child, I thought as a child, But when I became a man I was 'prepared and ready' to lay aside childish things." Indeed it might be said that in these verses we find the pedagogical gist of the whole matter of both secular and religious instruction.

Cleric and lay brothers should unite in urging upon our communities the great need of a more efficient religious instruction of our children. Thorns and thistles will undoubtedly strew the path along which this educational advance must proceed, and, as ever, discouragement will greet him who challenges the fences of tradition, but let the champions of less theology, and more and better pedagogy, be cheered and urged forward to a strong advocacy of this movement, contemplating the enrichment of child-life, by that homely philosophy of a discerning student of human affairs, "We are all headed for the city of the ideal; some of us may never reach it, yet the suburbs are very beautiful."

PSYCHOLOGICAL DIFFERENCES BETWEEN CHILDREN AND ADULTS

By Frank E. Howard, Berea College, Berea, Kentucky

That the boy is not a "little man," or the girl a "little woman" is quite generally acknowledged, but the specific points in which the mental life and habits of children differ from those of adults are not widely understood nor taken into account in educational practice. We need much more investigation of these differences, but very significant ones have already been detected and emphasized, and the disregard of these are responsible for many of our most common pedagogical errors. The consideration of these mental differences and their pedagogical significance is the purpose of this discussion.

Few experimenters have deliberately undertaken a specific comparison of the mental processes in children and adults; some of the differences are brought out incidentally, however, in general investigations of particular mental processes. We must also remember that in the consideration of this subject the term child cannot have a constant meaning. The mental processes of the normally developing child are constantly approaching the adult type, with varying rates of growth, and each stage has its characteristic marks. If we include the period of adolescence this subject can best be stated as "the effect of increasing age on mental processes."

I. Memory and the Learning Process

The mental process which lends itself most readily to objective test is memory, and of course memory, learning process, and ideational type, are so closely connected that they can hardly be treated separately, memory being the first step in the learning process, and both dependent on ideational type.

One of the first to secure experimental data on this subject was Kirkpatrick (17) in a test in word reproduction made upon pupils in a typical school and college, in all grades above the third primary. His table of results shows increase, from the primary department up, in the power of immediate reproduction of words of all kinds, but a difference of only about two words between primary and college students. Younger pupils required a longer time to write them and very likely let some words drop from their consciousness. College students must also have had better mental grasp. In reproduction after three days the college students showed no superiority over the children. On this third day when told what was wanted the grammar school pupils began to write immediately, while the college students hesitated and apparently made effort to recall the words. "This," says Kirkpatrick, "suggests, and many other facts make it probable, that children are equal or superior to educated adults in impressibility, in retention, and in spontaneous recollection, while the latter have gained more power of voluntary acquisition and recollection. Younger pupils are superior in the memory of spoken words as compared with written."

In a series of experiments on memory types Hawkins (12) obtained results which agree with those of Kirkpatrick. These experiments were made on public school children, students in a commercial school, and juniors and seniors in college. He found that younger pupils in nearly every case reproduced numbers without any hesitation, while the college students always hesitated and required more time. "It would seem to indicate," says Hawkins, "that pure spontaneous memory depends on the degree of impressibility, while a cultured intellect depends more on the power of reason. Young children are superior to adults in impressibility, in the power of retaining memory images and in spontaneous recollection while the latter have gained more power of voluntary acquisition and recollection."

Hawkins also performed experiments to determine which was stronger, visual or auditory memory in public school children from eight to twelve inclusive. Except in one instance the auditory was higher, and this probably was due to lack of attention on the part of a few pupils. In the same experiment with a class of commercial students ranging from fifteen to twenty years of age 28% reproduced in auditory and 45% in visual terms. Hawkins concludes that auditory memory is superior for children; visual, for adults. He thinks the reason is that children are more accustomed to auditory work while adults employ visual memory more.

We should note here the possibility of transfer from one sense department to another. Auditory stimuli may give visual images and the child may recall through the aroused visual image. On this account it is very difficult to reach any conclusions regarding ideational or memory type through objective tests. It is probable that both the mode of presentation and the type of ideation are factors in the general result. In this connection it may be well to mention Pöhlman's conclusion (23, p. 184) that auditory presentation is better for significant material (words, phrases, connected discourses, etc.), and visual for nonsense material.

Colvin and Meyers (8, p. 108) offer the following explanation why the younger pupil more readily retains meaningful material when presented in an auditory manner. " It is not because he is of a less pronounced visual type than is the older pupil. Indeed, the results of this and other studies show the reverse to be true. It is rather because auditory presentation is of necessity successive, and visual is generally simultaneous, that the superiority of auditory over visual is shown. The young pupil attends better when he gives successive attention to the material presented in an auditory manner than he does to the visual material over which his eye may move at will and without plan. If he is visual minded the material presented in an auditory manner is quickly (for the most part unconsciously) translated into visual terms and what is lost in this translation is more than compensated for by the more effective attention secured through the successive presentation when the material is read to the pupil. With the nonsense material, however, the visual presentation is a tremendous advantage in the earlier grades over the auditory, and the gain in successive auditory presentation is more than counter-balanced by the loss which the pupil suffers in not being able to form a distinct image of the nonsense syllable."

Netschajeff (22) tested 687 children in St. Petersburg for growth of memory (ages 9-18). Lobsien (19) repeated these in a more extensive way and with somewhat modified methods on 461 children (8-14) in the schools of Kiel. In general the results agree and indicate that the various kinds of memory show great fluctuation in development, most marked at the beginning of puberty. Lobsien found the greatest relative increase between the ages of ten and twelve. Memory of emotional states remains slightly undeveloped until puberty when it begins to grow rapidly. In general, the increase in memory is not the same year by year.

Meumann (21) refers to these and other results, also those obtained by himself and his pupils, and concludes that young children are very realistic in thought and that most are of visual type, while the mental processes of adults are more in terms of general ideas.

Colvin and Myers (8) made also tests on 520 children in Champaign, Illinois, later on 75 students in the University of Illinois, and still later on 200 such students, to discover the ideational type of the observers, and also the relation between various types of imagery and the learning of material appealing to the three chief sense departments. A part of their results bear directly on our problem. The experiments consisted chiefly of memory tests for both immediate and delayed recall. One series of tests was of nonsense material appealing only to the vision, another series was distinctly auditory. Their curves show concrete visual imagery to be remarkably strong in the earlier years. In the visual tests the third grade had an average of 75% correct results, fourth 74%, fifth 72%, sixth 72%, seventh 65% eighth 62%, high school 75%, university 73%. These results show an actual decline of concrete visual imagery through the grades with a tendency to recall in high school and university. Their explanation of this decline and subsequent recall is as follows: "The chief element in the retention of younger children is the impression represented by the concrete visual image; of the more mature child and the adult, the association. The rapid decline of the concrete image is not compensated for by a corresponding increase of the elements of association until high-school and university are reached. There is, therefore, an actual decline in memory for concrete visual material at about the onset of puberty." This decline is also pointed out by Lobsien and Netschajeff.

Colvin and Myers' curves show a fairly constant increase in verbal-visual imagery (nonsense syllables visually presented). They suggest that in the lower grades it is probable that a large part of the successful results were obtained by the observers holding a concrete visual image of the syllable in mind, while in higher grades the significance of the syllable was an important element of retention. In the upper grades attempts to assign names to the meaningless characters were frequently reported, less often in the grades. In the university it was the general procedure to assign some name to the nonsense character and join nonsense syllables together in some meaningful way. "It seems quite evident from these results," conclude Colvin and Myers, "that the undeveloped mind relies primarily on the impression for retaining its material, while the more mature mind is aided by holding the material through association." One rather surprising result of the Colvin-Myers series of experiments, was that tracing syllables, etc., with the blunt end of the pencil was not an aid to learning in the lower grades. In fact it seemed to be a hindrance until the eighth grade was reached. The motor imagery, if any aid, must have been so slight that it was more than offset by the distraction of the movement.

In the reproduction of a story appealing equally to the three sense departments there was a preponderance of motor recall in the lower grades. This is not, as explained by the authors, out of harmony with the previous results obtained in tracing nonsense syllables, but is doubtless due to the interest of the younger subjects in what was *done* in the story. The motor elements of the story were retained by all three ideational types in the lower grades. "By the time the University is reached the mere matter of interest has become of much less importance and the tendency towards verbal-visual imagery strongly asserts itself."

The following conclusions by Colvin and Myers summarize the results of their experiments in so far as they bear on our problem.

1. The young child thinks largely in concrete visual imagery, and while auditory and motor are present to some degree they play a relatively unimportant part. The child up to ten is predominantly a visualizer.

2. This concrete visual imagery, and probably all concrete imagery, tends to fall off in the more advanced grades, its place being taken by verbal imagery. The rise of the latter is probably due to the increase of the ability to associate and give meaning to memory material. This compensation is the least in the upper grammar grades, hence there seems to be an actual decline in imagery. Its subsequent recovery is due to the growth of power in the adolescent to associate and group into meaningful relations his memory material.

In tests of rote memory, Pöhlmann (23), with various materials and methods of presentation, obtained the data given in the following table:

NET EFFICIENCY OF VARIOUS MEMORIES IN RELATION TO AGE

Age	9	10	11	12	13	14	15	16	17	18	19	20
Average Capacity in %	39.4	41.4	55.7	59.1	62.1	68.9	55.3	62.9	58.6	58.0	65.4	68.3

Pöhlmann thinks that the general evidence is fairly clear that mechanical memory improves up to puberty but fluctuates after that period.

The studies of Shaw (20) and Henderson (13) in the memory of logical ideas show that adults surpass children in learning capacity but not in retentive capacity. According to Shaw's experiments the learning capacity of boys increased from third to ninth grade from 17% to 42%; girls from 18% to 43%. High-school boys averaged 40%, girls 47%; university students did no better. In later reproductions the experiments of Shaw and Henderson agree that younger subjects have as good retentive capacity as adults. A study of the following table by Henderson will show that it agrees very closely with the results obtained by Pölhmann.

AVERAGE PER CENT OF LOSS IN THIRD REPRODUCTION (4 WEEKS)

Age	Adults	16	15	14	13	12	11	10
Per Cent of Loss	14	8	13	15	14	12	10	10

Hence the logical as well as the rote memory seems best near puberty.

Much light is thrown on our problem by the careful and extensive researches of Meumann (21) and Radossawljewitsch (25. The general results of his experiments, Meumann thinks (21, p. 192 ff), show that the learning ability of children of all the school years of the *Volkschule* is far less than that of the adults tested. The adult of 46 has a greater learning ability than the school children in the best years of their development. The child requires more repetitions and more time to learn the same material. The adult being more accustomed to logical impressions, often has to exert his will power in pure mechanical learning, but as soon as he has practice the results are more favorable than in children in the *Volkschule* and in a certain degree even than in those in the *Mittelschule*. But the child retains what he has learned much longer than the adult, or in other words, forgetting proceeds less slowly. The same relation exists between younger and older children, i. e., the younger require more repetition but retain longer and reproduce after a certain interval more exactly.

Radossawljewitsch (25), who has conducted an extensive series of carefully controlled experiments with reference to differences between adults and children, presents the following summary of his results:

1. The adult requires in general fewer repetitions for learning an exercise than children. The older children require in general fewer repetitions to assimilate material than the younger.
2. The improvement through exercise (*Übungsfortschritt*) is greater in adults than in children.

3. The loss after practice (*Übungverlust*) is less in children than in adults.

4. The retention of adults is greater only in the first two time intervals (5 to 20 minutes), and after all other intervals the children retain more than the adults, and the younger children remember better than the older after the first and second intervals. Here is a very noteworthy characteristic of the childish memory. It assimilates with difficulty, then forgets quickly a certain quantity of the impressed material, but then retains all that survives the first period of forgetting with much greater tenacity than the adult memory.

5. The adult shows greater immediate retention than children, and the older children than the younger. The most intelligent of our children reproduce immediately four syllables and the others three and two. Adults produce up to eight and in a few cases ten and twelve syllables.

6. Recognition (*das Wiedererkennen*) is in general somewhat greater than in adults.

7. Children make in general more errors in repetition than adults. From this we should not conclude that the reproduction of the child is less exact than that of the adult. It is due more to the following: (a) The weakness of the child's will. (b) The weakness of his attention. (c) The difficulty of the nonsense material for the language abilities of the child. (d) The greater uncertainty "*des Gefühls des Auswendigkönnens*" in the child.

8. For the child, reproduction is in general a somewhat slower process than for adults. Formation of association is not so rapid.

9. Children, especially the younger, show greater tendency to rhythm (*Rhythmiserung*) than adults.

10. The persistence of ideas (*Perseverationtendenz der Vorstellung*) is greater than in adults.

11. The attention of the children is noticeably weaker than in adults and the younger the child the weaker the concentration.

12. The children, as the adults, show no pure ideation type.

13. As in adults there is a transfer from one memory type to another. It appears that a predominating visual type transfers to acoustic by continuous learning.

14. Girls show more of the predominating acoustic type, and the boys more of auditory and motor.

15. Children show in almost all time intervals greater absolute and relative saving in repetitions than adults, and the younger the child the greater the saving.

16. Forgetting is in almost all time intervals (except after 5 and 20-minute period) less than in adults.

A very interesting qualitative study of memory has been made by Colgrove (5). This is based on returns of 1,658 correspondents. An analysis of these brings out some significant facts concerning differences in memory due to age. Tabulations are made according to age in periods as following: I, 1-4; II, 5-9; III, 10-11; IV, 12-13; V, 14-15; VI, 16-17; VII, 18-19; VIII, 20-29; IX, 30-39, etc. At puberty there is a marked obliteration of infantile memories. At ten and eleven the motor memory curve begins to decrease in girls and to increase in boys and is nearly culminated for boys at 14 and 15. At 18 and 19 there is a marked and continued increase of visual memories for both sexes, which culminates at 30-39. Memory for activity in others also increases. As we should expect, there is a great widening of the range of memories during adolescence. After 20 there is a marked change in the memory content. Different memories culminate at different periods and bear close relation to the whole mental life of the period. In general, Colgrove's study shows that age is a very important factor in the memory content (hence whole mental content) of both child and adult.

Ideation and Ideational Type

The conclusions drawn by Meumann from the experiments of Ziehen and those by himself and Winteler in Zurich are the most enlightening material thus far presented on this phase of our topic. The tests were made with boys from 7 to 14 years of age. Meumann's conclusions may be summarized somewhat as follows: Children are more superficial in reproduction, i. e., they relate words and ideas more through outward resemblances. They show more of the *"Perseverationtendenz"* of ideas. When a child falls into a certain manner of reproduction he holds to it with great persistency. This occurs more frequently with the younger, and is also characteristic of the more unintelligent child; e. g., one boy was strongly inclined to say "very" with every adjective. Another characteristic of children is that they make fewer verbal associations than adults. Their associations are more of objects and events. Children's ideation is much more concrete. Adult ideation is mostly in silent speech. Among the verbal associations which occur with a child, simple word modifications are favored, e. g., *Post—Post-Karte, Bett—Bettfedern.*

The child thinks more in individual ideas than the adult. Meumann says that in many thousands of reproduction experiments on adults he has found very few reproductions with individual ideation (often only 5 or 6% of the reproduction are of this type). They usually reply to the stimulus word in abstract terms.

The unintelligent children show more abstract reproduction than the intelligent. Hence it is not a good thing for the child to approach the ideation type of the adult prematurely. It seems psychologically and pedagogically well established that the child should remain as long as possible in concrete individual ideation. It thereby acquires a large store of concrete "*Anschauungsvorstellungen*" on which it can later build up its abstractions.

This predominance of the *"Individual-vorstellungen"* decreases gradually with the years and with the progressive development of the child. There is a gradual transition to the adult type. This appears with the thirteenth or fourteenth year, though Meumann says he has found in children of this age strongly predominating *"Individualvorstellungen."*

Ziehen states that these *"Individual-vorstellungen"* are mostly of a visual nature. According to the experiments of Netschajeff, Lobsein, Winteler, and Pfeiffer, the realistic ideation of children is predominatingly visual.

Meumann discusses the question of the greatest influence in the reproduction of children. Combining his own experiments with those of Ziehen he finds that the school instruction has much influence in reproduction. This is especially true if the stimulus word is rather unfamiliar. Most of the material is furnished by the instruction in natural science, history, and local information (*Heimatkunde*). The next greatest source is the home environment and family life. The private reading of the child also furnishes much material.

According to Ziehen it is not the readiest or most fluent associations that occurs oftenest in the reproduction experiment but those which claim the greatest interest in the life of the child and which have the greatest feeling tone.

The association-reaction time is much greater in children than in adults. The mind of the child works much more slowly than that of the adult. This difference is so astonishing that one is often inclined to doubt the experiment and think that the reaction is not taking a normal course, but one is convinced after a time that these long reaction times are typical of the childish mind.

The quickness of reproduction increases with each year of the child's life. The older the child the quicker the reaction. The *"Individual-vorstellungen"* require longer time than is required when they are not present, and according to Ziehen longer than the less familiar general ideation (or *Allgemeinvorstellungen*). The richer the ideation the longer the time.

Meumann makes a significant pedagogical suggestion here. He says that formal facility in reproduction can be essentially improved by practice in both children and adults. This is important for the treatment of the question in instruction (*Frageunterrichts*). Now the reaction experiment is in a certain degree an abbreviated question experiment, the spoken stimulus word corresponding to the question. Here it is worthy of notice, that as a rule the shorter the time of reaction the more worthless the reproduction. "I have made," says Meumann, "control experiments with children and adults in which I instructed the subject to react as 'quickly as possible,' and then warned them not to react until the meaning of the word was fully understood. When this latter instruction was given the mental content and value of the reproduction increased significantly." His pedagogical conclusion here is one of vital importance in elementary and to some extent in secondary instruction. The practice of requiring pupils to give quick answers or asking a great many questions during a class period is a very common one in our American school rooms. Now the quick answer represents the first and most worthless answer. We know that children do not take time to get the content of a question clearly before their mind, and rapid fire questioning only encourages loose habits of speaking and thinking.

Attention

Meumann's studies of the child's attention consciousness are enlightening. Unfortunately he holds to the use of the term voluntary and involuntary, or active and passive attention. As Titchener (Text-book, p. 271) and others have pointed out, passive and active attention are only different stages in attentional development and neither have any distinctive features. However, this use of terms need not detract from the value of Meumann's tests or of his well-grounded conclusion.

Meumann observes that the attention of the child tends more towards distribution than towards intensive concentration. Thus with this tendency is associated a decided inconstancy and instability. This, however, is subject to much variation in individuals, and may be greatly decreased through practice. Investigation shows an apparent increase in the range of attention with growing familiarity with the objects exposed in the experiment, but this is effected not by the attention alone but by the whole perceptive process. Of the most simple elements (points, lines, etc.) presented simultaneously the six-year-old child perceives clearly two to three, the twelve-year-old three to four, the fourteen-year old on an average, five, and the adult four to six.

By range or span of attention is meant the number of impressions that can be attended to without decreasing the clearness which each one would possess if attended to alone. Meumann insists on the difference between range of consciousness (all elements perceived at once) and attention (all clearly perceived). In children the increase in the number of elements in the field has a more unfavorable effect on the attention than in the adult. The effect of apperception in the child is in general more arbitrary, subjective, and unreliable.

Tests of attention to successive stimuli are concerned not only with the range of the attention for single elements, but also with the recognition of groups—phenomena much the same as the above. Meumann found that the span of attention for six to seven-year-old children was four to five simple sounds, for eleven to twelve-year-old children five to six, and for fourteen-year-olds, six to eight. In general, (1) the effect of practice on the span of attention seems as slight in the child as in the adult, (2) younger children tend more to let their attention be diffused and broken up. Though they may get ideas of more numerous stimuli these ideas are more inexact than in the adult. The child's span of consciousness is relatively large, but his span of attention is relatively small. (3) Fluctuating attention is the general type till the eleventh or twelfth years. (4) Attention of children is more sensory than intellectual. (5) Attention is adapted to new activity much more slowly than in the adult. (6) Constantly repeated stimuli are necessary to hold the child's attention for any length of time, *i. e.*, the attention is typically dynamic. (7) There is more of the motor or physical accompaniments of attention in a child, this is a marked characteristic up to the twelfth or thirteenth year.

We may note concerning the general mental faculties (1) that up to the sixth or seventh year the faculty of practice is apparently less than in the adult—due to lack of endurance in attention. (2) In general the child is mentally and physically much more easily fatigued than the adult but provided vith the faculty of rapid recovery.

The common basis for the fluctuation and lack of endurance in childish attention is the greater instability and inconstancy of the organic processes which are sympathetically connected with all mental processes.

Suggestion and Imagination

The extensive use of "*Aussage*" tests have clearly demonstrated the excessive suggestibility of the child mind. There are of course great individual variations among both children and adults, but there is perhaps no greater factor of difference between the adult and child type of mind than the difference in the tendency to be affected by suggestions. The age of maximum suggestibility has not been determined, but it is plain that there is marked decrease at puberty.

The suggestibility (warmth) experiment by Guidi (11) indicates that nine is the age of maximum sensibility, but Okabe at Cornell found no characteristic differences between the grammar grade boys and adults. The experiment by Small on the "Suggestibility of Children," though not performed on adults, shows a decreasing percentage with advancing age. His tests for illusion of perfume made on pupils from grade three through the high-school gives the following percentages of those who thought they smelled the perfume: I, 98%; II, 95%; III, 83%; IV, 63%; V, 50%; VI, 27%; VII, 13%; VIII, 0%; High-school, 0%. In grades I, II, and III when asked by the teacher if they were sure they were not mistaken, the pupils said "sure." In grade II immediately after the first a second spray was used and the pupils asked if they noticed any difference. Several at once said it was "a good deal stronger."

Experiments on illusion of sight were made on 381 pupils in grades I, II, III, IV, V, VII; 291 saw movement where there was none; 90 saw no motion. Per cents of illusions for the grades I to VI respectively are 96%, 81%, 80%, 70%, 34%, and 71%. Grade VI brought the per cent down. The room was well lighted and the experiment was performed immediately after recess.

The regular and rather large decrease of suggestibility as shown in these tests—what we would expect, and doubtless if these tests were tried on adults the per cent would be much lower.

What is known as the ink-blot experiment has been performed by a number of experimenters with interesting results. Each child is presented with a piece of paper on which there is a large and irregular blot of ink and asked to tell what he sees there. Kirkpatrick (18) obtained the following results:

AVERAGE NUMBER OF NAMES GIVEN TO INK-BLOTS (KIRKPATRICK)

Grade	I	II	III	IV	V	VI	VII	VIII
Average	2.9	2.5	2.6	1.8	1.9	1.7	2.1	2.2

In explanation Kirkpatrick says, "The younger children seemed to have no doubt whatever of the spot being a picture of the object named, while the older children said 'it is some like' or 'it looks like.' The table shows a steady decrease in the number of objects seen until the seventh and eighth grades are reached, where the average is nearly as high as in the two lowest grades. Kirkpatrick thinks this is probably due to fact that the children of the fourth, fifth, and sixth grades have become more critical in their sense perceptions "as they have learned from life's experiences to be more careful in their judgments." On the other hand the older pupils regarded the whole exercise as a work of imagination and had no reserve in stating what was suggested to them by the ink-spots.

Since we really know very little about the imaginative consciousness and experimental data concerning it must be gained chiefly through introspective observation, no definite statement can as yet be made regarding the difference between the child and the adult type of imagination.

REASONING

Miss Ellison (9) has given us an interesting though not extensive study of children's capacity for abstract thought as shown by their ability to define abstract terms. The data consisted of the definitions of twenty-seven words, mostly abstract nouns, as given by 219 boys and 253 girls of ages ranging from eight to fifteen. These words were later given to seventeen students in the psychology classes in Clark University with a view to comparing the definitions of the children with a group of adults. The definitions were graded as to excellence of form after the following scheme:

A. Definition by Sample
1. Definition by phrase or clause.
2. Word to be defined followed by "something" or "anything."
3. Involving mention of person or thing.
4. Definition by examples.
5. By use of adjective.

B. Definition by Abstract Phrase.
- 6. When and What, That and If clauses.
- 7. Use of Infinitive.

C. Definition by Equivalents.
- 8. Synonyms.
- 9. Fair Definitions.

Miss Ellison offers the following helpful conclusions: "Such a mastery of common abstract ideas and of language as would make possible reasonably perfect definitions is nearly or quite wanting in children of thirteen and under, though for several years before that time the abstractions have been clearly enough grasped and the vocabulary has been large enough to allow a good deal of definition by synonyms. Still earlier the children seem to hold the idea in a distinctly concrete fashion and to convey it, when required to do so, by means of concrete examples variously expressed; while the youngest children of all cite examples of the use instead of really giving the meaning of the word, possibly for the reason that at that stage the idea itself cannot be brought clearly before consciousness." Seventeen of the words were given to university students, and in the case of part of the words they were asked to note introspectively anything of importance to be observed in the framing of the definition.

The chief thing shown by these introspections is the large mass of associations which the words called up. The definitions show a greater command of language and the influence of reading and book definitions, but on the whole were not strikingly different from those of the children. Four-fifths of the students stated that the word called up a concrete image.

Mr. C. H. King (16) issued the following questions to teachers in the primary, preparatory and public schools of England.

1. One boy met another and noticed that his eyes were red. He said, "You've been crying." Do you think he was right? Why?

2. All cold can be driven out by heat. John Thomas has a cold, so he can be cured by sitting by the fire. Do you agree? Give a reason.

3. There were several clever boys in this class and they were all careless, so a clever boy must be careless. Do you agree with this?

4. French people are excitable and so are Italians, so all foreigners are excitable. Is this true?

The children were divided into three groups namely: A, seven to ten years of age; B, ten to twelve; C, twelve to fifteen. Questions one and two were given to group A, two and three to group B, and three and four to group C.

Two thousand papers were received. From two or three schools the papers were thrown out as they showed effects of coaching. The author thinks that the questions have the following points in their favor. (1) All, or nearly all, appeal to the experience of the children in everyday life. (2) The language is simple. Against them it may be said: (1) The form though colloquial, is in a measure stilted and unnatural. (2) That they are liable to misconstruction (some were misconstrued). (3) That question 2 of I and question 1 of II should have been given to older pupils (per cent of success in answers show this). Question 2 of III appealed too much to the imagination and the logical dealing with the question is frequently interfered with.

		Number of answers.	Per cent of real solutions.
I.	Question 1	39	39.1
	2	26	9.4
II.	1	51	20.7
	2	71	30.0
III.	1	144	44.4
	2	172	56.8

King makes these conclusions: (1) That intellectual bias crops up in a most decided manner irrespective of education or special training. (2) That a considerable portion of those who have received a good education and have reached the age of 15 fail to show anything but the germs of thinking of a logical kind. (3) That education improves the faculty.

He prints a number of the typical answers to each question. While some plainly show that the child has no grasp of the question, in others it is doubtful whether the failure is due to lack of reasoning power or lack of ability to state the answer clearly. Some seem to indicate that the child saw the fallacy but was unable to state it in words.

Ability to deal with generalizations and abstractions depends upon (1) the use of associations acquired by experiences and (2) facility in the use of language. Now the child's limited experience provides him with very few associations and his reasoning ability must be correspondingly weak; his lack of the power of exact or abstract definition is a matter of common observation among those who have taught elementary work in reading and expression.

The weakness of the child's reasoning ability is very well stated in the following observations by Dr. Hall (Adolescence, p. 451).

"Children observe keenly and this involves analysis and regrouping. They are often religious sceptics at ten. They ask why, how and what for in ways that reveal causal ideas. There are all forms of the syllogism in infant mentation. On the other hand children's ideas of size, perspective, time and space, are so narrow and the multitude of their impressions so overwhelming, their superstitions so many, their credulity so great, they are so victimized by sense, so bound down to verbal literalness, their experience is so small, they have so little control of their attention, and their minds are so permeated with error and ignorance, that it is scarcely too much to say that almost up to puberty they can hardly think at all in any proper sense."

SUMMARY

The following conclusions seem now safely established:

I. The Learning Process.
  1. The child requires more time and more repetitions than the adult to learn the same material.
  2. The improvement through practice is less in the child than in the adult.
  3. The loss after practice is less.

II. Memory.
  4. The memory span is less.
  5. Retention is greater (except after first brief interval, 5-20 min.).

III. Attention.
  6. The attention is more inconstant and unstable.
  7. The range of attention is less.

IV. Ideation.
  8. The reaction time of association is much greater.
  9. The child thinks more in individual, concrete ideas, and this ideation is predominatingly visual. Verbal imagery and abstract association are rarer and more common in the dull child.
  10. There is more of the "perseverance tendency" in ideas.

V. Suggestion.
  11. Susceptibility to suggestion is greater.

VI. Reasoning.
  12. The power of abstract definition and logical reasoning is weaker.

BIBLIOGRAPHY

1. BOLTON, T. L. Growth of Memory in School Children. *Am. Jour. of Psy.*, 1892. Vol. 4, pp. 362-380.
2. BOURDON, B. L'influence de l'age sur la mémorie immédiate. *Rev. Philosophique,* 1894. Vol. 38, pp. 148-167.
3. BINET, A. Attention et adaptation. *L'Année Psy.*, 1900. Vol. 6, p. 259 ff.
4. BROWN, H. W. Thoughts and Reasonings in Children. *Ped. Sem.*, 1893. Vol. 2, pp. 358-396.
5. COLEGROVE, F. W. Memory, an Inductive Study. N. Y., Holt, 1900? 369 pp.
6. COLVIN, S. S. Ideational Types of School Children. *Ped. Sem.*, 1909. Vol. 16, pp. 314-324.
7. ———. The Learning Process. N. Y., Macmillan, 1911. 329 pp.
8. ———, and MYERS, E. J. Development of Imagination in School Children and the Relation Between Ideational Types and the Retentivity of Material Appealing to the Various Sense Departments. *Psy. Rev., Mon. Supp.*, 1909. Vol. 11, pp. 85-126.
9. ELLISON, L. Children's Capacity for Abstract Thought as Shown by Their Use of Language in the Definition of Abstract Terms. *Am. Jour. of Psy.*, 1908. Vol. 19, pp. 253-260.
10. GALE, M. C. & H. Early Reasoning in Children. *Jour. of Adolescence,* 1902. Vol. 2, pp. 149-174.
11. GUIDI, G. Recherches experimentales sur la suggestibilities. *Arch. de Psy.*, 1908. Vol. 8, pp. 49-53.
12. HAWKINS, C. J. Experiments on Memory Tests. *Psy. Rev.*, 1897. Vol. 4, pp. 289-294.
13. HENDERSON, E. N. A Study of Memory for Connected Thoughts. N. Y., Macmillan, 1903. 94 pp., and *Psy. Rev., Mon. Supp.*, Vol. 5.
14. HUBER, E. Assoziationversuche an Soldaten. *Zeit. f. Psy. und Phy. des Sinn.*, 1911. Vol. 59, pp. 241-272.
15. KEMSIES, F. Gedächtnissuntersuchen an Schülern. *Zeit. f. Päd. Psy. und Pat.*, 1900. Vol. 2, pp. 21-30; 84-95.
16. KING, C. H. Reasoning Powers of Children. *Paidologist,* 1903. Vol. 5, pp. 157-162.
17. KIRKPATRICK, E. A. An Experimental Study of Memory. *Psy. Rev.*, 1894. Vol. 1, pp. 602-609.
18. KIRKPATRICK, E. A. Individual Test of School Children. *Psy. Rev.*, 1900. Vol. 7, pp. 274-280.
19. LOBSIEN, M. Experimentelle Untersuchungen über die Dedächtnissentwicklung bei Schûlkindern. *Zeit. f. Psy. und Phys. des Sinn,* 1902. Vol. 27, pp. 34-76.
20. MEUMANN, E. Vorlesungen. Leipzig, Engelmann, 1907. Vol. 1, pp. 89; 192; 223.
21. ———. Ökonomie und Technik des Gedächtnisses. Leipzig, Klinkhardt, 1908. pp. 267-269.
22. NETSCHAJEFF, A. Experimentelle Untersuchungen über die Gedächtnissentwicklung bei Schûlkindern. *Zeit. f. Psy. und Phys. der Sinn.*, 1900. Vol. 24, p. 321.
23. PÖHLMANN, A. Experimental Beiträge zur Lehre vom Gedächtniss. Berlin. Gerdes-Hödel, 1906. 191 pp.
24. QUEYRAT, F. La logique chez l'enfant et sa culture. Paris. Alcan., 1902. 153 pp.
25. RADOSAWLJEWITSCH, P. Das Behalten und Vergessen bei Kindern und Erwachsenen nach experimentellen Untersuchungen. Leipzig, Nemnich, 1907. 193 pp.

26. **Reinhold**, F. Beiträge zur Assoziationslehre auf Grund von Massenversuchen. *Zeit. f. Psy. und Phys. der Sinn.*, 1910. Vol. 54, pp. 183-214.
27. **Saling**, G. Assoziation Massenversuche. *Zeit. f. Psy. und Phys. der Sinn.*, 1908. Vol. 49, pp. 238-253.
28. **Shaw**, J. C. A Test of Memory in School Children. *Ped. Sem.*, 1896. Vol. 4, pp. 61-78.
29. **Whipple**, G. M. Manual of Mental and Physical Tests. Baltimore, Warwick & York, 1910. 531 pp.

MY MIND AND I AND THE KINDERGARTEN

By Martha MacLear

What a pleasure it must be to have a mind that will "stay put." A mind which is content with things as they are, that is not always asking *why* and *why* and *why*. A mind which is content to travel along the broad highway built by those who have gone before, instead of rushing into all kinds of by-paths, wading in streams and climbing mountains as yet unbeaten by many feet.

To live with such a mind must be conducive to the proverbial bed of ease. But Providence has not endowed me with such a blessing. Willy-nilly, my mind insists upon asking *why* and *why* and *why*. In vain I say, "Because we have always done so." Mind replies, "That is no reason at all, let us improve although we have to break a new path in order to do so." So when mind began to cogitate upon the kindergarten I knew the "game was up."

In regard to the value of the kindergarten, opinion may be roughly divided into that of belief in it as a vital part of education, and that of entire disbelief in any value that it may possess.

Mind believes in the kindergarten as being the most important part of education and the part most advanced toward an ideal of freedom in self-control. But could it not be improved? Why rest content with things as they are?

Recently we have been studying, again, the education of the Greek people. Never have we been so impressed with the glory of their creative ability and the power of their freedom of thought; their development of individual initiative subordinated to the welfare of the city state. Never has the appeal of gymnastics and music, as interpreted by them, been so alluring. Here was mind's opportunity—why not adapt such a splendid education to the kindergarten?

The place to begin such a radical reform would be, of course, with the Superintendent of Schools and the Board of Education. Without their co-operation and persuasive influence on the community, the parents would believe that the school had gone mad. It would be too much to ask that the Board and the Superintendent themselves return to the bright joyousness of Greece. No stretch of the imagination could compass that picture. But, if they would not dance themselves, doubtless they might be led to see the value of such practices for the children.

Suppose they did, then what? The joy of experimentation for one thing, the pleasure of hewing a new path from ignorance to knowledge; the elation of the searcher after truth. And the joy of watching the children develop each his own personality and reach a measure of self-expression through creative effort while learning to subordinate himself to the welfare of the whole. The only drawback—the apprehension of what would happen to the children when they entered the average first grade.

Gymnastics and music do not sound very educative, or capable of making a well-rounded programme. Let us see how it would work out.

On first coming to school the children would take off their shoes and put on soft sandals. In hot weather, the stockings, too, might well be removed.

Whenever the weather permits the gymnastics or some other work should be given out of doors. At least half of the morning should be spent in the open air. There is always a school yard and, sometimes, a small park which could be used.

The morning would run something like this: Morning prayer and greeting—a short talk between teacher and children—each one expressing his ideas freely;—singing, alone, by twos or threes and all together;—playing with the voice—singing without piano or teacher.

Next, with all the windows open, or better, in the open air, rhythms, or games or dramatized stories.

Time for lunch has come. While some children set the table, some prepare the lunch, and all eat together of the simple fare. The clearing up will take time and patience on the teacher's part. But the gain in self-control and self-reliance in the children would warrant it.

The story hour comes apace, when the children group themselves around the teacher anyway they like,—the freer the position the more conducive to elasticity of thought in hearing and telling stories.

There is just time left for some work at the tables. It may be painting or clay modeling or freehand folding and cutting. It may be work at the sand-table or on the floor playing with the blocks. It may be play with the doll's house or the making of furniture for it. It may be work in the garden or an excursion to some point of interest. Then the children gather for their good-bye song and school is over.

Such a radical change in practice would necessitate a change equally as radical in material. Instead of laying one tablet with its edge to the point of another tablet, the children would learn through dishwashing and table setting, to idealize a homely task, also that steadiness of hands and feet are necessary to success. If a symbolic meaning is desired, the dishpan may stand as a type of the universality and intrinsic value of woman's work.

There would be no time to count the faces and the edges of a cube, or to make symmetrical patterns with seeds or lentils; no time to make pictures of houses with sticks, for we should be too busy building homes. There would be no time to look at intricate pictures, poor in art, painted by a sign-painter in Germany, when the pictorial wealth of all the centuries is available. Many songs could not be learned for we should be too busy learning to sing and speak properly. Elaborate, symbolic games could not be played, for we would be too young to apprehend them. Also we would be too busy to sit for half an hour in order that we might fold two paper circles.

But there would be time to build, to draw and paint, to make a house and the furniture and rugs for it; time to tell and retell the best of all kinds of stories, thus gaining a wealth of new ideas and mental pictures; time to express in voice and body the message that music has for us; time to learn to move with freedom among moveable furniture; time to learn to consider the rights of others and to express one's own desires; time to learn of the outside world and to develop sympathy through participation, in miniature, in its activities; time to develop the body through proper food, fresh air and exercise; time to learn to love nature through excursions and gardens. Surely these things are worth doing, even though we break away from some traditions in doing them.

It may be claimed that all this is nothing new. Maybe it is not. I am accustomed to the viewpoint that all virtue is found in Froebel's philosophy. But the emphasis is new, and here is where the difference lies. To stress gymnastics and music, apprehended in the sense in which the Greeks used them; to minimize the occupations and eliminate the gifts, is a radical departure from precedent. So radical, in fact, that few kindergartens would even discuss it. If such discussions would only take place, we might hope for a renaissance in the best and most vital part of our educational system.

"DOG LATIN" AND SPARROW-LANGUAGES USED BY BALTIMORE CHILDREN

By Leonard Keene Hirshberg, M. A., M. D., Johns Hopkins University

The children of Baltimore who range in ages from five and six years to twelve and fourteen years use a number of secret languages to communicate with one another. In order to prevent other children from understanding what they are saying, they add simple monosyllables as prefixes or suffixes to each spoken word.

When my sister and I were children, she and her girl chums had one set of these sparrow-languages, while my boy friends and I had a dozen others each different from those of the girls, and also widely different from each other. The Baltimore children of to-day call these secret lingoes "dog Latins," we did the same twenty years ago.

These secret languages are used by the youngsters in some such fashion as this. A child wishes to invite another to a birthday party and does not care to have the others know about it. They have already arranged their suffix syllable. It may be "la," "ly," 'y," "ki," "ve," or similar ones. One I heard recently was this.

"Will*ve* you*ve* come*ve* to*ve* my*ve* birth*ve*-day*ve* part*ve*-*yve* next*ve* week*ve*?"

"Ifve myve mothve-erve willve letve meve."

"Askve herve. Itve isve Mon*ve*day*ve* nightve."

"Allve rightve."

The translation of this is perfectly apparent when written; it is not so simple when rapidly spoken unless you previously have the key in the extra syllable "ve."

Sometimes each syllable of English has the *"Dog Latin"* syllable added to it. At other times the secret vowel sound is only added to an entire word, no matter how long it is.

Yesterdayo Io hado myo marbleso outo to*o* the*ó* country*ó*."

This gibberish seems manifestly too plain to be secret, yet I have heard children converse thus with great mystery for a half-hour and more. The behavior of children under these conditions, indicates that there is a response to something more than mere mystery or secretiveness. There are included, elements of responsibility, dignity, superior knowledge, the pleasure of play combined with a whetting of the "intellectual" appetite.

The sparrow lingo that contains a prefix instead of the suffix lends itself to many more difficulties than the other and commoner vowel sounds. Older children at times employ the prefix in their "Dog Latin," but even they as soon as they get into deep water, quickly tire of it.

The other day two children, one eleven, the other thirteen, hazarded this bird talk. The prefixed vowel sound, it will be observed, is unusually clumsy.

"Mad*I* mad*am* mad*going* mad*to* mad*the* mad*moving* mad*pictures* mad*to* mad*day.*"

"Mad*I* mad*can* mad*go* mad*if* mad*I* mad*want* mad*to,* mad*but* mad*I* mad*am* mad*going* mad*to* mad*my* madgrandmothers."

Baltimore children as a rule regard these secret languages as something much more serious than a pastime or mere play. This is evident because they may be heard to use the talk while playing indoor as well as outdoor games. It is instructive to observe children as they talk. Not long ago I was tempted to—and did—lift off an auxiliary telephone receiver, when I heard a twelve year old child hold a conversation with a little girl of her own age, as nearly as can be recalled like this. The suffix is " ly."

"Arely youly comly-ingly uply toly playly?"

(The reply was here unheard.)

"Ally rightly forly youly."

"Ily can'tly helply itly. Itly isly notly myly faultly."

"Canly Ily comely downly?"

"Ily willly askly maly-maly."

"Nevly erly mindly, Ily havely toly takely aly naply anly howly. Comely uply asly soonly asly youly canly."

"Allly rightly. Goodly byly."

These languages of childhood seem to be much more usual among the youngsters of Baltimore than in other neighborhoods. It therefore seems to be instructive and desirable to bring these languages to the attention of mothers and educators.

ECONOMIC REASONS FOR VOCATIONAL EDUCATION

By Jonathan F. Scott, Altadena, California

A study of the history of education reveals the fact that educational movements and educational systems are, in far greater measure than is generally realized, the outgrowth of social and economic conditions. Education is the attempt of a civilization to perpetuate what it believes to be most vital in itself. This attempt is sometimes so successful, however, that a type or a phase of education often persists beyond its time of real usefulness. Suited to the conditions of one period, it has little value in a later age when the social forces that gave it birth have passed away. The study of rhetoric at Rome, of intense practical value in the time of Cicero, when the state needed orators to defend its liberties, became the useless ornament of a decadent nobility when the Roman Empire fell under the sway of the imperial hierarchy. When a type of education has thus persisted and lost its value there comes, sooner or later, the demand for a readjustment to the life of the times and the construction of a new type, or types which will more perfectly mirror the age.

Such a readjustment is taking place to-day in America; there is a deep-seated demand that education be brought in touch with "life." Much under discussion at the present time is the movement for further vocational education, which some believe to be a passing fad, others the product of enduring causes of varied character—psychological, sociological, and economic. The aim of the present article is to examine certain of the economic factors underlying this movement and thus to show that in future this type of education is likely to be of greater importance than some of its most ardent admirers now realize.

Among the factors that render probable the general adoption of a great system of industrial and technical education are the following: 1—the present difficulty of obtaining skilled labor; 2—the passing of the American frontier; 3—the growing competition between American and foreign manufacturers; 4—the dependence of national power upon industrial strength, a matter which is likely to become more important in the future because of the position which the United States has taken as a world-power; and 5—the general tendency of a civilization to perpetuate what it believes to be most vital in itself; a tendency seemingly exemplified in the value attached by modern society to material well-being with the not impossible crystallization of this point of view in a new type of education.

Of the present demand for an increase of skilled labor, little need be said here, as much has already been written on the subject. American manufacturers claim that there are "no expert journeymen, second hands, foremen,"[1] and that the great mass of workingmen are lacking in what may be termed "industrial intelligence."[2] At an earlier date skilled mechanics were drafted from the American small shop to the factory, or were obtained from Europe; but no longer can the manufacturer count on these two sources of supply.[3] The small shop is becoming more and more an institution of the past and the tendency in almost every field of production is toward larger manufactories and the combination of these in gigantic corporations. The all-around skill and fineness of execution resulting from the apprenticeship training of the small shop are therefore becoming increasingly rare.

The change in the character of immigration from Europe, has cut off a once fertile source of supply of trained mechanics. Early immigration to America was largely from northern and western Europe and included a large proportion of skilled workmen. Immigration from this part of Europe has ebbed during the past thirty years[4] and a new tide has set in from the southeast. The new element includes a far smaller proportion of skilled labor than the old.[5]

The policy of labor unions, also, has frequently been opposed to the production of a large number of skilled workmen. "Union after union limits the number of apprentices,"[6] and the manufacturers claim that this restrictive policy "has hastened the advent of the trade school many years."[7] Since Europe and the small shop no longer furnish a large supply of skilled labor and since the unions limit the number of apprentices, the manufacturer is in a quandary as to where to find the expert workmen that he needs. A system of industrial education seems to him to furnish a solution of the problem.

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[1] Report of the Massachusetts Committee on Technical and Industrial Education (1906), p. 90.

[2] Ibid., p. 4.

[3] Carlton, Education and Industrial Evolution, p. 199.

[4] In 1882 27.7% of our total immigration came from Great Britain, in 1905 10%. The number of persons emigrating from Germany to America decreased from 250,630 in 1882 to 37,564 in 1905. Commons, Races and Immigrants in America, p. 71; Ibid., p. 69.

[5] Ibid, p. 108.

[6] Report Massachusetts Committee on Technical and Industrial Education, 1906, p. 89.

[7] Proceedings of the 1906 meeting of the National Association of Manufacturers of the United States of America, p. 50.

It may be asked why the manufacturers should not themselves furnish this industrial training, since their interests are concerned so closely; some of the larger establishments have, indeed, equipped apprentice schools of their own to meet the situation.[8] But there are certain reasons why the entire solution of the problem cannot safely be entrusted to the manufacturers. In the first place under the factory system the division of labor has been carried to an extreme—further in America than in any other country[9]—and the manufacturer's temptation to subdivide labor is so strong that there is a constant tendency to perfect the youth in one or two processes rather than spend time and apparently waste money in teaching him all processes. In the next place so great has become the mobility of labor in modern times that the individual manufacturer is apt to feel that it is of little advantage to him to educate boys, who, once trained, may leave him to enter the employ of a rival concern. The manufacturer is primarily interested in the development of his own business rather than in the welfare of the American boy. Those who advocate a return to the medieval system of apprenticeship should remember that under modern industrial conditions there can be little of that comparative identity of economic interest and those close personal relations between master, or manufacturer, and apprentice, upon which so much of the success of the institution once depended. For economic reasons, if for no other, society cannot afford to look solely to the manufacturer for a solution of the problem of industrial education.

The passing of the frontier affects tremendously the development of the United States. Until comparatively recent times there was a steady stream of colonization westward to take up the free or the cheap lands of the pioneer regions. It required but little capital for a man in the East to get together his belongings, leave his home, transport his family and goods by water or prairie schooner to the great west where land was plentiful and fertile, where independence and comfort were well within the realms of possibility. The Western claim meant hope to the discouraged, satisfaction to the discontented, opportunity to the ambitious. The westward movement also reacted favorably upon the east, for it drained off the surplus population, thus lessening competition and keeping up wages. In general, life was freer and easier in America than in the more crowded countries of Europe.

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[8] Wright, Carroll D., The Apprenticeship System in the United States.

[9] Commons, Races and Immigrants in America, p. 124.

During the past twenty or twenty-five years the cheap lands have become far less plentiful than in earlier days. In the year 1889, when the rich territory of Oklahoma was about to be thrown open to occupation, thousands stood on the border, waiting for the signal to be given that they might rush in and stake out claims. During the decade 1900 to 1910 the prices of farm lands in many of the states rose enormously.[10] Cheap lands, then, can no longer be counted on as a vital force to aid us in the solution of social and economic difficulties. The great problem presented by the passing of the frontier is this: How are we to provide adequately for our constantly and rapidly increasing population? The success of Germany in dealing with a similar, but more difficult, situation points out one answer to the question. Fit the individual for his proper place in life and increase the total wealth of the country by means of an education along industrial and technical lines.

The passing of the cheap lands is bound to give an impetus to the movement for scientific agriculture. In the early days the pioneer farmer could afford to exhaust the soil rapidly by his crude methods of agriculture and then move on to new and more fertile lands. Once the land ceases to be cheap this process becomes impossible while the competition of the pioneer farmer grows less formidable to the scientific farmer of the east. There must now be an intensive development of the soil similar to the development in Germany fostered by scientific agriculture. "Hereafter," says Carver, "there will be a higher premium upon intensive and scientific farming than there has ever been before. So long as there was free public land to be had for the asking the opportunities for the scientific farmer were limited by the possibilities open to the pioneer farmer, who needed nothing but a team and a few implements and a very meager equipment in the way of knowledge to enable him to grow crops successfully." [11] A great development of experiment stations now becomes possible which would have been practically impossible fifty years earlier "because of the lack of opportunity for the use of scientific knowledge in competition with pioneering." [12] Thus the movement for the scientific study of agriculture has behind it a powerful influence in the passing of the frontier and the consequent need for an intensive development of the soil.

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[10] Percentage of increase in value of farm lands in certain States:

Alabama, 116.1.
Arizona, 475.8.
Illinois, 105.8.
Iowa, 127.2.
Massachusetts, 32.8.
Washington, 278.3.
Minnesota, 72.8.
Missouri, 104.3.
New York, 32.0.
Ohio, 57.9.
Virginia, 100.8.

Compiled from Year-book of the Department of Agriculture for 1910, pp. 499-596.

But the scarcity of cheap lands reacts also upon industrial conditions in the cities. As the expense of purchasing a farm becomes greater the natural tendency of the worker is to turn to industrial life for his means of support.[13] All the garish attractions of the modern city urge him in the same direction. The surplus population instead of being drained off to the West tends to take up its abode in the cities. The natural tendency of this is to increase competition and thus lower wages in industrial pursuits. At the same time the rise in the price of land tends to raise the price of agricultural products, making the cost of living greater for all classes in the towns. The struggle of the future will be far more severe than that of the past unless something is done to relieve it. The economic efficiency of all workers is becoming an economic necessity. The need for industrial education in America has therefore never been as great as it is now.

The economic leads to the moral problem. According to Prof. Carver, scarcity forms the economic basis of evil. "where there is scarcity there will be two men wanting the same thing; where two men want the same thing there will be an antagonism of interests; where there is an antagonism of interests between man and man there will be questions to be settled—questions of right and wrong, of justice and injustice—and these questions could not arise under any other circumstances. The antagonism of interests is, in other words, what gives rise to a moral problem." [14] According to this

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[11] Carver, Principles of Rural Economics, p. 109.

[12] Ibid, p. 110.

[13] Figures on occupations taken from the Twelfth Census Reports (Volume on Occupations, p. L.) show the trend toward industrial and commercial work.

	1870.	1880.	1890.	1900.
Number engaged in Agricultural Pursuits	5,948,561	7,713,875	8,565,926	10,381,765
Trade and Transportation	1,244,383	1,871,503	3,326,122	4,766,964
Manufacturing and Mechanical Pursuits	2,677,765	3,784,726	5,678,468	7,085,309

[14] Carver, The Basis of Social Conflict, Papers and Proceedings of the American Sociological Society, Vol. II (1907), p. 13. The development of vice, however, can scarcely be said to be wholly dependent upon scarcity.

theory greater scarcity of land will bring growing antagonism of interest and hence moral problems more and more difficult of solution. One of the methods of alleviating this situation brought about by scarcity is to increase production.[15] Vocational education, then, in so far as it increases production, aids in satisfying the wants of man and helps to solve the moral problem.

In general, America is facing the difficulties—economic, social and moral—of a more crowded environment. Vocational education is one of the means for meeting this situation.

The recent and rather remarkable increase in the exports of American manufactures furnishes another reason for further industrial and technical training. In 1880 the United States held fourth place among the countries of the world as an exporting nation; in 1900 she ranked first.[16] In this development of our export trade, manufactures have played an increasingly important part, as the following table illustrates:

Percentage of manufactured goods in total of exports.[17]

1860	12.7	1890	17.8
1870	15.0	1900	31.6
1880	12.5	1905	35.8

As the population of the United States grows, the supply for exportation, of certain raw materials, such as wheat, must diminish. "The future appears to belong" to manufacturers.[18]

If, then, the American manufacturer feels the need of vocational education for his employees when he competes only with his fellow-countrymen he must feel it far more keenly when he has to face on foreign ground the competition of other countries where systems of industrial and technical training are already established. Since the cost of many kinds of labor in America is so great as compared with other countries,[19] and since the natural resources of the country cannot be exploited by individuals to the same extent as formerly, the manufacturers of the United States can ill afford to neglect, in competition with their foreign rivals, so strong a weapon as vocational education.

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[15] Carver, The Economic Basis of Evil, Harvard Theological Review, Vol. 1, p. 110.

[16] Bogart, Economic History of the United States, p. 454.

[17] Ibid.

[18] Coolidge, United States as a World Power, pp. 177-8.

[19] Great Britain, Board of Trade, Report on the Cost of Living in German towns, p. lii; United States, Bureau of Labor, Digest of Report of British Board of Trade on Cost of Living in the Principal Industrial Towns of the United States, pp. 58-59.

It was on their return from the St. Louis Exposition of 1904 that the German visitors to America reported to their government that American competition was not to be taken seriously. Possessed of great natural vigor and physical resources, Americans were over-confident, self-satisfied and did not realize the need of concerted action to produce greater efficiency. The Germans pointed out the lack of a system of industrial training and spoke of the "reliance on a general and more or less superficial education."[20] One thing the foreigners failed to realize—the readiness of Americans to remedy defects once they are made clear. The Germans themselves kindly pointed out one of these defects.

As the competition among individuals is growing constantly, so the struggle of the nations for power is ever increasing in intensity. At the present time this struggle is before everything else a contest for territory. "The nineteenth century has been an age of nationalism. The twentieth is to be the age of national imperialism."[21] It is not merely the American frontier that is disappearing; the free lands of the world are being brought under the jurisdiction of the powers as rapidly as possible. The diplomatists of London, Paris and the Wilhelmstrasse are ingratiating themselves with the weaker nations of the earth, while they watch one another with cat-like eyes, ready to checkmate a move of any one of their number toward territorial increase. For this international rivalry, with the possibility of war, the great states of the earth must be fully prepared.

Now the modern nation holds that its power depends largely upon the extent of its resources and the skill with which these are developed. "Money is the sinews of war." The smaller the territory, the greater must be the skill in the development of national resources. Only through the utmost forethought and ingenuity has Germany been able to maintain her huge army and powerful navy, to hold most of her rapidly increasing population within the borders of her limited territory. The world stands amazed at Germany's economic development and military strength, and asks how all this has been brought about. Many answers have been given but opinion seems to be strong that industrial and technical education have had much to do in the attainment of this result.[22]

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[20] Person, H. S., Industrial Education, pp. 4-5.

[21] Reinsch, World Politics, p. 3.

[22] Alderson, V. C., The Need of Technical Education, p. 4; Proc. National Association of Manufacturers for 1910, pp. 276-277; Blondel, L'Education Economique, p. XXI; Ware, F., Educational Foundations of Trade and Industry, p. 101; Person, H. S., Industrial Education, p. 13; Hanus, P. H.; Beginnings of Industrial Education, p. 21.

Until comparatively recent times the United States has been a spectator of the game of world politics rather than a participant in it. Even to-day her diplomacy is in its infancy. But with the disappearance of the frontier, the war with Spain and the acquisition of island possessions, the United States has become a world-power. The war with Spain "brought new prestige and enlarged opportunities. The occupation of the Philippine Islands has placed the nation on an altogether different footing in the Orient, and it can no longer pose as a disinterested spectator of political changes in that quarter of the globe."[23] The United States, then, has definitely entered the world struggle. Like the other nations of the earth she will tend to develop her strength by all the means in her power; and vocational education is not the least of these means.[24]

It has already been stated that it is the tendency of each age to perpetuate by means of educational institutions those things which it believes to be most important. Thus the education of the Spartan was military because war and the preparation for war were the chief factors of Spartan life. The education of the Middle Ages was religious because the spirit of the age was religious and the Church was the great social force. Latin and Greek formed the staples of study during much of the modern era because of the combined influence of the Renaissance and Reformation. The Renaissance saw in the classics the great sources of culture, saw in them also the great storehouses of practical information. To the reformers, Latin and Greek, with Hebrew, constituted the keys for unlocking the Scriptures and for getting at the commentaries thereon. So the school curriculum was dominated by these studies. Examples of this adjustment of education to the spirit of the times might be multiplied from history.

Now, it is the opinion of many that the modern "Zeitgeist" is dominantly economic, even materialistic in character. Paulsen says "A materialistic view of the world after first taking hold of large sections of the educated classes, is now widely prevalent amongst the masses."[25] The struggle for money and material possessions seems to play a greater part than ever before in the world's history. There can be no doubt that the commercial development of the modern era and the industrial revolution of the eighteenth and nineteenth centuries have distinctly colored our present civilization. If we admit the great value attached by modern society to economic as compared with religious, æsthetic, or purely intellectual considerations, then it follows that our age will be likely, sooner or later, to construct a type of education more distinctly economic, more practical in character, than the present system. Such an adjustment has already begun in the movement for vocational training.

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[23] Latané, America as a World Power, p. 319. See also Coolidge, United States as a World Power.

[24] "That nation," says Victor C. Alderson, "which neglects to equip its workmen with the armament of industry—technical education—will surely be defeated and become a decaying nation." Alderson, V. C., Technical Education an Economic Necessity, p. 14. For the value of industrial education in increasing production, see Person, H. S., Industrial Education, Chapter VI.

[25] German Education, Past and Present, p. 175.

All this indicates that the movement for vocational education is no mere fad, but a response to important needs of modern civilization. The demand of the manufacturer for skilled labor is far greater than the supply, and, under modern industrial conditions it is difficult and often unprofitable for him to train adequately his apprentices. As the American manufacturer competes more and more with foreigners in the markets of the world he must reduce the cost of production and enhance the quality of his goods. The far-sighted manufacturer, therefore, asks for industrial education. From the point of view of the workingman industrial education is becoming more and more necessary with the passing of the cheap lands. He must be thoroughly equipped in order to win in a struggle made fiercer by a more crowded environment. From the point of view of the nation, vocational education is necessary that national efficiency may be increased and our country hold its own in the world-struggle. Thus the future of this type of training seems assured.

THE COMING INTERNATIONAL CONGRESS ON SCHOOL HYGIENE

The First International Congress on School Hygiene was held in Nuremberg in 1904 with a membership of 1247 persons. The participants in the Congress represented twenty-four different countries, and the papers were presented in three different languages. The report of this Congress, with a total of over 170 papers, contains the proceedings of the largest and most eminent body of hygienists that had ever gathered to consider the special subject of school hygiene. The scope of the papers illustrates well the wide expansion of school hygiene in recent years. Only about one-eighth of the time of the Congress was taken up with school hygiene in the narrower sense,—school organization, heating, ventilation, and the like. The larger part of the report is filled with papers on school diseases, the hygiene of instruction, the hygiene of the school child, the hygiene of the teacher, and the like. Perhaps a score of the speakers presented the results of original experimental or statistical investigations. The Second International Congress was held in London in 1907; the Third, in Paris in 1910, and the reports of these congresses also are important contributions to the literature of school hygiene.

The Fourth International Congress of School Hygiene is to be held in Buffalo August 25-30 of this year. This should be an event of great importance in the history of American education. The executive committee have made extended preparations for a scientific exhibit of hygienic apparatus and for an elaborate program. The colleges and universities of the country, the municipalities, boards of health, school boards, the woman's clubs, and similar organizations, are entitled to appoint delegates, and a large number of visitors from abroad are expected. Professor Burgerstein told the writer last fall that he hoped to bring 300 Austrian teachers to attend this Congress.

The President of the Congress is Charles W. Eliot, President Emeritus of Harvard University; and the Vice-Presidents are W. H. Welsh of Johns Hopkins University, and Dr. Henry P. Walcott, Chairman of the Massachusetts Board of Health. The Honorary Vice-Presidents are: Abraham Jacobi, Columbia University; William H. Burnham, Clark University; His Eminence, James Cardinal Gibbons; Philander P. Claxton, U. S. Commissioner of Education; John H. Finley, President of the College of the City of New York; Adelbert Moot, Regent of the University of the State of New York; Sir James Grant, Ottawa; M. Uribe Troncoso, Mexico, D. F.; Rupert Blue, Surgeon General, U. S. Public Health and Marine Hospital Service; H. M. Bracken, Minnesota State Board of Health; Andrew S. Draper, Commissioner of Education, State of New York; Theobald Smith, Harvard Medical School; David Starr Jordan, Leland Stanford Jr. University; Dr. Henry R. Hopkins and Dr. Woods Hutchinson. The Secretary General is Dr. Thomas A. Storey, of the College of the City of New York.

The bulletin of the Congress issued in April gives the names of committees in Austria, Hungary, Belgium, Canada, Denmark, France, Germany, Great Britain and Ireland, Italy, Japan, Mexico, The Netherlands New Zealand, Russia, Spain, Sweden, Switzerland, and other countries, as well as the United States.

Papers have already been promised by a large number of American and foreign workers in the field of school hygiene. Among the prominent speakers expected from abroad are: Professor Griesbach of Mülhausen, President of the Nuremberg Congress; Dr. L. Dufestel of Paris, medical inspector of the Paris schools; Dr. James Kerr of London; Dr. Max Lobsien of Kiel, Germany; Dr. Altschul of Prague; Dr. Jessen of Strassburg; Dr. Leo Burgerstein of the University of Vienna; Dr. Cecil Reddie of Abbotsholme, England; Dr. Schuyten of Antwerp, and others.

Most of the prominent workers in school hygiene in this country are expected to contribute to the Congress; and special discussions are being arranged on the subjects of mental hygiene, oral hygiene, sex hygiene, school feeding, health supervision of University students, tuberculosis among school children, physical education and college hygiene, Binet-Simon tests, and the like.

An especially important feature planned for the Congress is a scientific exhibit of hygienic apparatus, hygienic conditions, and the like. This is under the direction of a special committee at the head of which is Dr. Fletcher B. Dresslar, formerly specialist in school hygiene in the Bureau of Education at Washington, and now Professor in the Peabody College for Teachers, Nashville, Tennessee.

The citizens of Buffalo are making extensive preparations for the entertainment of delegates. The sum of $40,000 has been collected in that city alone for the purpose of defraying the expenses of the Congress and the reception of delegates. Any one can become a member of this Congress who is interested in the subject and willing to contribute the membership fee, which is $5 for regular members; $2.50 for associate members. Copies of the preliminary bulletin may be obtained from the Secretary.

Teachers and school officials and the general public as well as physicians and specialists in hygiene have an opportunity to show their interest in school hygiene and inform themselves of the recent developments on this subject. Representatives from all the leading countries of the world are expected to be present. The program covers a very broad field. The official languages of the Congress will be English, French, German, Spanish and Italian. The program committee and the committee on the scientific exhibit have made preparations for making this Congress the most important meeting in the interests of child hygiene ever held in this country, and it is hoped that the scientific contributions will be equal in value if not superior to those of any international congress on school hygiene that has ever been held.

The importance of the subject of school hygiene has received tardy recognition, but this Congress, it is hoped, will show teachers and school officials and the general public the real significance of the subject and emphasize the urgent need for extended medical inspection in the schools of this country and reform of school work and school conditions with regard to the facts of hygiene. As pointed out by the officials of the Congress in a recent communication, the results of medical inspection in the schools indicate that of all pupils 26 per cent suffer from eye strain; 6 to 12 per cent have enlarged tonsils; 12 to 24 per cent, some nasal obstruction; 2 to 5 per cent, defective hearing; 50 to 75 per cent, decayed teeth; 10 to 30 per cent, nervous disorders; 5 to 20 per cent, some deformity; 1 to 15 per cent, skin diseases; 1 to 67 per cent, pediculosis.

The result of the prevailing ignorance and lack of training on the part of teachers has resulted in grotesque and almost criminal errors in many schoolrooms. The teacher has been trained to look at the scholastic product instead of at the children. Their attention has been so absorbed in the writing books, the products of manual training, the notebooks filled, the examples solved in arithmetic, and the like, that they have had no time to notice the overheated rooms, the bad odors, the deformed posture of the children, the strained eyes and the various defects by which the pupils are handicapped. In some schools it has actually been true that teachers have urged children to come to school in spite of contagious disease; and failing to recognize defects of sight and hearing and the like, by which children are handicapped, they have done gross injustice to the defective; and sometimes the children themselves have recognized the unhygienic treatment and could have instructed their teachers in regard to the proper treatment of their fellows.

The need of better training of teachers in school hygiene can hardly be emphasized too strongly. Of all absurdities of modern education nothing perhaps is greater than the neglect of this subject in the normal schools. In recent years it is true that this subject is usually given some attention in connection with school management or other subjects; but a special course with a competent instructor should be given in every training school, and teachers should be made familiar with the fundamental facts established by modern hygienic studies. This is essential not merely that teachers may help in the early detection of school diseases and the like, but also that they may have an hygienic apperception and be trained to notice unsanitary conditions in the schoolroom, improper habits of pupils in school work, conditions of fatigue, nervousness, and the like, and be able to contribute to the positive aim of modern hygiene,—the training of children in habits of healthful activity both physical and mental.

All organizations concerned with hygiene and education,—the National Education Association, the American Medical Association, and the special organizations for child welfare; State and city Boards of Health, State Boards of Education, and the various charitable organizations; the innumerable miscellaneous clubs and societies for education and child welfare; especially normal schools and other training institutions that are awakening to the need of introducing school hygiene; and other organizations whose work is dependent on intelligent public interest in child hygiene,—all have now the opportunity to help arouse the public to proper appreciation of the importance of this subject, and may anticipate help from this congress.

W. H. B.

BOOK NOTES

Modern philanthropy; a study of efficient appealing and giving, by WILLIAM H. ALLEN. New York, Dodd, Mead & Co., 1912. 437 p.

This is a most interesting and important book. Mrs. Mary W. Harriman, wife of the railroad magnate, received over 6,000 appeals for help, and desiring to take the wisest course, turned most of these letters over to the author, who is director of the Bureau of Municipal Research and the National Training School for Public Service, who has studied these letters and told us that 3,000 of these individuals wanted in all $22,000,000; organized activities wanted $207,000,000; schools and colleges aggregated $54,000,000; hospital and health, $83,000,000; homes and asylums, $6,000,000; civic work, $120,000,000; churches, $121,000,000. The map shows the distribution of these letters, which follows somewhat the density of population. We are told how these people came to write them, all the ruses, methods of approach, workmanship of appeal. Then we are told about the difficulties in the art of giving, the endowment dream, need of a national clearing house for givers, clearing standards of appeals, and finally, a magna charta of givers. There are many illustrations and the work, like everything else from Dr. Allen's pen, is fresh and comes directly from and goes to the heart of the matter.

The theory of evolution in the light of facts, by KARL FRANK. With a chapter on ant guests and termite guests by P. E. Wasmann. Translated from the German by Charles T. Druery. London, Kegan Paul, Trench, Trübner & Co., 1913. 241 p.

These authors present here a very interesting and profound discussion of the general principles of evolution, which owing to their position is more like an authoritative pronouncement of the Catholic church upon the subject than anything we have yet had. The authors, who are Jesuits (at least the first of them) are very able scientists of high rank in their own domain, and they have gone over very carefully the questions treated and come to the general conclusion that the manifold alterations of plants and animals never goes so far that the allocation to a certain type cannot be made with great certainty, whether it would be adult or embryological, and the alterations in fossil organisms are of the same kind. The remarkable thing is the rule, viz., that each organism breeds true, while current evolution of the Darwin-Haeckel type is only one of "approximating valuation" which has led us in the wrong direction. Theories of evolution will always remain "since everything points to the fact that there was and is an evolution in the organic world," but this does not express itself in the impossible spontaneous leaps from inorganic to organic or from plants to animals, nor in objectless hither and thither variation, but there is a constant harmony between construction and function and the external conditions of life. "Life was not acquired by organisms themselves nor were the evolutional tendencies." Both were received from another source, from the Creator.

A guide to the Montessori method, by Ellen Yale Stevens. New York, Frederick A. Stokes Co., 1913. 240 p.

The author pleads as an excuse for adding another to the Montessori books, the growing interest in England and America in this remarkable woman. We are first told about the founder of the school, then the controlling ideas, then later chapters discuss self-discipline through obedience, the two-fold aim of education, viz., biological and social, physical, sensory education, from sensations to ideas, the three R's in a new form, the Montessori parent, teacher, movement, its critics, its deeper message, suggestion for the summer and for the suburbs. On the whole we think this book justifies its existence, but we sincerely hope that the excessive adulation of the author and the fervid zeal with which her cult is now developed will not bring any serious reaction that will interfere with such merit as it has, which in our opinion has been vastly over-estimated.

Mind and health, with an examination of some systems of divine healing, by Edward E. Weaver. New York, Macmillan, 1913. 500 p.

The author first discusses the mind, conscious and sub-conscious, then the psychological principles of psychotherapy and its armamentarium, its technique, value, reality in general and religious reality, religious systems of mental healing, of which the author makes five, viz., Christian science, the Emmanuel movement, divine healing of the Dowieism type, the Christian alliance type, and fifth, metaphysical healing, the demands of a valid religious system of healing, what constitutes it, how the church may heal. The author has a good bibliography and an index of names and subjects. This is a very painstaking work which it must have taken long to write and it will be of great use and interest to those concerned with the subjects it treats. From the standpoint of the writer of this note, it leans a little too sympathetically toward movements like Emmanuelism and the English Psychic Research Society. Yet the facts are the main things and the author fortunately for the reader keeps the two quite distinct throughout.

Medical inspection of schools, by Luther Halsey Gulick and Leonard P. Ayres. New York, Charities Publication Committee, 1913. 276 p.

The first edition of this work, printed in 1908, was exhausted within three months, and was reprinted the next year. During the three and a half years since, there has been much increase in the number of cities having medical inspection and physical examinations have become a more integral part of the system, so that there is an increasing demand for a revision so that we are told that "while covering much of the matter in the original book" the text has been entirely rewritten and the description of methods and forms as well as the quantitative material brought down to date.

The posture of school children, with its home hygiene and new efficiency methods for school training, by Jessie H. Bancroft. New York, Macmillan Co., 1913. 327 p.

The chapter headings, erect carriage, how to judge and correct it, the spine, head, chest, shoulders, feet, home hygiene of posture, that of dress, efficiency methods, class standards, auxiliary aids, give a rather inadequate conception of the content of this popular and copiously illustrated book, with 26 plates and 108 figures illustrating various postures and the modes of correcting defects. The author is an assistant director of physical training in the New York public schools and the book is addressed to the corps of special assistants. The book is useful and timely.

Culture, discipline and democracy, by A. DUNCAN YOCUM. Philadelphia, Christopher Sower Co., 1913. 320 p.

The author first gives the present status of his subject, then analyzes formal discipline, discusses conditions favorable for general discipline, the old idea is gone and the old value of formal subjects, the interdependence of culture and direct preparation for life, uniformity for various localities in the general course of study is limited by educational relationships which must be certainly memorized, the inadequacy of tests for the mere elimination of the harmful, tests for relative worth.

National Education Association. Report of the committee on teachers' salaries and cost of living. ROBERT C. BROOKS, executive secretary. Published by the association, Secretary's office, Ann Arbor, Mich., 1913. 328 p.

The papers here are roughly grouped under the increased cost of living, its causes, with letters and references; while the second part deals with economic and social conditions of teachers in certain large mid-west cities; the third with salaries, schedules, tenure and pensions. Reports like this ought to be analyzed and the main points brought out a little in perspective like the excellent work of this sort which is often done in the Parliamentary blue books of England. Through these 328 pages the reader is left almost no guide as to what is really worth hunting down and what not.

School feeding; its history and practice at home and abroad, by LOUISE STEVENS BRYANT; with an introduction by P. P. CLAXTON. Philadelphia, J. B. Lippincott Co., c. 1913. 345 p.

This work is dedicated to Professor Lightner Witmer and bears what appears to be a very hearty and official endorsement from the United States Commissioner of Education. After a chapter on the history and present status of the school feeding movement, the writer proceeds to discuss physical deterioration, malnutrition in England, provision of meals in elementary schools there, the canteen *scolaires* in France, school meals in German municipalities and other European countries, lunches in American elementary schools, in open air schools. investigation on hand feeding, malnutrition in childhood, food needs of growing children; and adds school menus, bibliography, appendices.

School janitors, mothers and health, by HELEN C. PUTNAM. Easton, Pa., American Academy of Medicine Press, c. 1913. 201 p.

This work has three chapters, the first on the prevention of school fatigue; the second, mothers' clubs and clean schoolhouses; the third, school janitors and health. The chief value of the book is in the last chapter and the author's ideals would make janitorship almost a profession.

The moral education of school children. By CHARLES KEEN TAYLOR. Preface by Arthur Holmes. C. K. and H. B. Taylor, Mermaid Lane and Navahoe Streets, St. Martin's, Philadelphia, n. d. 77 p.

This little book is called an expression of the general movement represented by the principle that a bad body makes a bad boy and a good body makes a good boy. The author gives a moral education schedule for use in the schools designed for children from five to sixteen years, inclusive, tabbing off a number of different virtues for each age, with a few lines of comment on each. This and part three, which is really a note on working children, constitute the main value of the book.

The progressive business man, by ORISON SWETT MARDEN. New York, Thomas Y. Crowell Co., 1913. 166 p.

Among the eighteen chapters the following are typical: What will system do for you; prosperity; put sunshine into your business; capital and labor; what you owe your employees; sweetening the day's work; a better spur than the whip; the new business philosophy; looking outside for grants; integrity; when the head of the firm takes it easy; courtesy brings business; looking the latter in the face; don't fire the boy; the tight wad employer; suspicious mental attitude; why men fail.

The joys of living, by ORISON SWETT MARDEN. New York, Thomas Y. Crowell Co., 1913. 403 p.

We have here twenty-six chapters on such subjects as: A professional at living, ethics and happiness, the sin of tired nerves, joy of imagination, friendship, reading, content, home joy killers, joy at work, longevity and happiness.

Old age, its cause and prevention; the story of an old body and face made young, by SANFORD BENNETT. New York, Physical Culture Publishing Co., c. 1912. 394 p.

Here is a man of seventy-two, who has, as his photographs show, rejuvenated himself from the old man he was at fifty so that he does not look, as he thinks and tells us his friends do, over forty. The photographs of his physical development are certainly very remarkable. His shoulders, chest, back, legs, are those of an athlete, and although he has not much to boast of in the way of health and longevity from his parents, and began with a mild heart trouble, he is now a man of admirable physical development. All or nearly all his exercises are taken in the morning, horizontal, in bed, after he wakens. He has very little apparatus and besides the exercises which have so greatly improved his heart and overcome his varicose veins and increase his chest capacity, he has a number of other friction exercises for his face, from which all wrinkles have been rubbed out, and he tells us and indeed the photographs indicate that he has even brought back a good deal of his hair and eliminated much of its grayness. The language of the book is plain, frank, direct, and it cannot fail to attract a great deal of attention and do much good.

Scientific management in education, by J. M. RICE. New York, Publishers Printing Company, 1913. 282 p.

The author here reprints eleven articles, the chief topics being educational research, obstacles to rational reform, essential of elementary education, economy of time, futility of the spelling grind, the test in arithmetic, the causes of success and failure, results of a test lesson in language, need of a new basis of education, and supervision.

Ethics and education, by J. HOWARD MOORE. London, G. Bell & Sons, 1912. 188 p.

The heads of the important chapters are school and evolution, importance of ethical culture, the call of the past, educational anxieties, practical, vocational, intellectual and ethical anxiety, can morals be taught, contents of ethics, law of the larger self, causes of immorality, vestigial organs, survivals of the wild, biology of child nature, reforming the curriculum, the world to be, a course in ethical culture, works, methods, suggestions.

Enjoyment of poetry, by MAX EASTMAN. New York, Charles Scribner's Sons, 1913. 224 p.

The various chapters treat of poetic people, names practical and poetic, their technique, imaginative realization, choice and comparison in poetry, wines, sleep and poetry, realization of action, of things, emotions and ideals, poetry itself, how to enjoy and compose it.

The garden city movement up-to-date, by EWART G. CULPIN. London, Garden Cities and Town Planning Association, 1913. 63 p.

This attractive little book gives a tabulated summary of estates, details of schemes, copartnership in housing, with the work of garden cities and town planning associations, with very many tables, views, diagrams, etc., showing the great extent to which the movement has gone in England. The title may easily mislead Americans, who are accustomed to associate garden city only with children's gardens.

Agenda, 1913. Düsseldorf, Tietz, 1913. 96 p.

This little work contains a series of articles by different writers. One is entitled the century of the child, another is on child care and culture, another treats the soul of the child as an individuality, while education in general, the child and art, protective measures, and finally a calendar, constitute this copiously illustrated little book.

The shattered halo and other stories about schools, by C. W. BARDEEN. Syracuse, C. W. Bardeen, 1913. 250 p.

Mr. Bardeen here publishes eight more of his characteristic simple and effective stories of school life and work. It is pleasant to note that these stories seem to improve with the successive publications of the genial author.

A cyclopedia of education, edited by PAUL MONROE. Volume 4. New York, Macmillan, 1913. 740 p.

It is a pleasure to note that the standard set up by the first volume of this work seems to be maintained. This volume comes down to Polytechnic schools.

Healing influences, by LEANDER EDMUND WHIPPLE. New York, American School of Metaphysics, 1913. 227 p.

The Pierce spellers. A two-book course in spelling for grades three to eight, by WALTER MERTON PIERCE. Boston, Ginn & Co., c. 1912. 131 p.

Skolbarns Intressen; en psykologisk-pedagogisk Undersökning, av GEORG BRANDELL. Stockholm, A. V. Carlsons Bökforlags-Aktiebolag, 1913. 256 p.

An introduction to the theory of mental and social measurements. by EDWARD L. THORNDIKE. 2nd ed. rev. & enl. New York, Teachers College, Columbia University, 1913. 277 p.

The modern warship, by Edward L. Attwood. New York, G. P. Putnam's Sons, 1913. 146 p.

The Vikings, by Allen Mawer. New York, G. P. Putnam's Sons, 1913. 150 p.

Variations in the grades of high school pupils, by Clarence Truman Gray. Baltimore, Warwick & York, 1913. 120 p. (Educational Psychology Monographs, ed. by Guy Montrose Whipple, no. 8).

The atmosphere, by A. J. Berry. New York, G. P. Putnam's Sons, 1913. 146 p.

Academic algebra, by George Wentworth and David Eugene Smith. Boston, Ginn & Co., c. 1913. 442 p.

Burke: Reflections on the French Revolution. Edited by W. Alison Phillips and Catherine Beatrice Phillips. Cambridge, University press, 1912. 311 p.

The earth, its shape, size, weight and spin, by J. H. Poynting. New York, G. P. Putnam's Sons, 1913. 141 p.

A first course in physics, by Andrews Millikan and Henry Gordon Gale. Rev. ed. Boston, Ginn & Co., c. 1913. 442 p.

The case for woman suffrage; a bibliography. By Margaret Ladd Franklin. New York, Published by the National College Equal Suffrage League, 1913. 315 p.

Side-stepping with Shorty, by Sewell Ford. New York, Grosset & Dunlap, c. 1908. 325 p.

Open air crusaders. The individuality of the child versus the system; together with a report of the Elizabeth McCormick open air schools. By Sherman C. Kingsley. Elizabeth McCormick Memorial Fund, 315 Plymouth Court, Chicago, Ill., 1913. 128 p.

National Education Association. Year book and list of active members, revised to December 31, 1912. Chicago, Illinois, Meeting. Published by the association. Secretary's office, Ann Arbor, Mich., 1912. 429 p.

National Education Association of the United States. Journal of Proceedings and Addresses of the 50th annual meeting, held at Chicago, Illinois, July 6-12, 1912. Published by the association, Secretary's Office, Ann Arbor, Mich., 1912. 1427 p.

Stories for little folks; the princess and the goblin. By George Macdonald. Simplified by Elizabeth Lewis. Philadelphia, J. B. Lippincott Co., c. 1913. 124 p.

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PHYSIOLOGICAL AGE AND SCHOOL ENTRANCE[1]

By ARTHUR K. BEIK, Clark University

INTRODUCTION

Child study has recognized in a general way alternating, or at least differentiated, periods of development, roughly classified according to predominant characteristics, physical and mental, and located with reference to the age of the child in years. Infancy is the term usually applied to the first year or years of life. Following infancy there comes the period of childhood, pretty sharply marked off at the later limit by the characteristics accompanying the attainment of pubescence.

The period of childhood is again variously divided by the different authors, the location of the division points depending upon the characteristics chosen as division marks. Because of the grouping of some important factors about those years at which school is usually begun, it is becoming more general to designate this as a natural division point, or perhaps better, nodal period, of development. The time preceding this nodal period is referred to as "earlier childhood," while the time from this to the appearance of pubescence is referred to as "later childhood." Later childhood, then, begins approximately at the time of entrance to the graded school and continues up to, or until a short time after, the completion of the graded school work, and might well be characterized as "the age of the grades."

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[1] Pres. G. Stanley Hall suggested the field in which to work out this thesis. The suggestions, advice and helpful criticism received from Dr. W. H. Burnham made its completion possible. For the helpful assistance from both these persons the writer wishes to acknowledge his indebtedness. He wishes also to express his thanks to those who assisted in the collection of material, among whom should be mentioned especially Dr. Theodate L. Smith and the library staff.

The fact that it does so nearly coincide with the grade school years makes later childhood a most important period from the view points of child study and pedagogy. It is a period deserving of the closest study, especially as regards the child's development and his fitness to succeed in the tasks and cope with the new situations presented in the school environment.

Following a brief characterization of the developmental features at the close of this later childhood period, it is our intention to take up in this paper a somewhat more detailed discussion of those developmental features that group themselves about its beginning. It is our purpose to collect and condense available facts and data from the many investigations that have dealt with particular phases of development in these early years, to relate them in so far as is possible, and to suggest something of their significance.

What we have chosen to call the later limit of childhood is marked by those special phases of development that accompany the attainment of pubescence. It would be useless, for our purpose, to attempt a detailed description of these, though it may be worth while to mention a few of the more important points to which we may wish to refer later.

Very prominent among the physical changes characteristic of the pubescent period is that of growth, both in height and weight. Growth in height shows a remarkable acceleration, extending over several years. The average time for girls is from the tenth or eleventh to the thirteenth or fourteenth year, while for boys it runs from about the eleventh or twelfth to the fifteenth or sixteenth years. Most curves show a similar acceleration in weight following a little later, and occurring also a little earlier in girls than in boys. Both height and weight continue to increase for some time after this rapid acceleration, but at a slower and more uniform rate, so that boys and girls may be said to have almost reached adult size at the close of the rapid pubertal weight increase.

Closely related to these phenomena of general growth, occur rapid growth of certain parts and organs, rapid changes in body proportions, remarkable additions in muscular power, change in quality and increase in quantity of possible mental achievement, and, perhaps most important of all, the attainment of pubescence.

Dr. Crampton, *e. g.,* would seem to give the factor of pubescence a place of prime importance, since he makes it the basis of grading for "physiological age" during this period (26).

Data with regard to time of eruption of the teeth seem to indicate a close relationship of dentition to the general stage of advancement of development. From tabulations of the number of canines and molars present, Crampton finds a definite correlation of tooth appearance and weight and of tooth appearance and height (26). The more extended investigations of dentition are of interest in this connection also. Boas and Wissler (11), Berten (8), and Röse (77) all found that the eruption of the teeth was earlier, on the average, for girls than for boys. Recalling the fact of earlier pubescence of girls, the suggestion of a relationship between pubescence and dentition, or perhaps better, the relationship of both dentition and pubescence to the general stage of advancement in development, is strong. There is a problem here worthy of further investigation. More knowledge of the relationship of advancement of dentition at this time to other factors of development ought to be very valuable.

Studies of the skeletal development, as worked out by Rotch (80), Pryor (70) and others, while not showing correlations for ossification of any particular part of the skeleton with pubescence, show in a general way a greater rapidity in girls at this stage of life. Great variability in degree of rapidity is also shown, especially by the work of Rotch and Smith (81) and also by that of Pryor indicated above.

Variability in the time of these developmental phenomena is everywhere evident. Tabulations of growth all show that the acceleration extends over several years. Variability is fully as great in dentition, as indicated by the tabulations for time of tooth eruption. Time of appearance of pubescence is also extremely variable. Crampton found this factor appearing in boys from 12.75 to 16.25 years of age.

These main facts concerning the developmental phenomena prominent at the pubescent period are sufficient to indicate that the actual limitation of childhood is not to be referred to a mere temporal reckoning of the length of life, but rather to development. They indicate also that this limit does not coincide with a definitely marked "time line," but rather constitutes a broad "time zone" within which the transition from later childhood over to the earlier stages of the adolescent period is accomplished. Within this zone, the variability is sufficiently great, as has been pointed out by Dr. Crampton, Rotch and Smith, Pryor and others, to render grading on the basis of chronological basis alone inadequate.

Finally, this stage of development is reached by girls earlier than by boys, as has been indicated by almost every study of development having to do with this period of life.

While the close of later childhood is thus pretty clearly marked off by prominent developmental features, there is not at its beginning such a clear cut and astounding transition. Those factors which may be used as marks of development are much harder to distinguish, and therefore to correlate. There is available, however, a considerable body of facts that may assist us in the solution of one or two of the most important problems that have to do with this period, and in the statement of some other problems that need solution.

Among the important problems are these two: (1) Is there, at the age of five or six or seven years, evidence of a transition or nodality of development comparable in any manner to the transitional stage at puberty? (2) Is the advancement in the two sexes equal at this period of life, and if not, how do they differ? We shall take these up in order.

Evidences of Nodality

The School Age.—Turning to the first of the problems just indicated, it may be worth while, before taking up the discussion of actual physical characteristics, to point out that this period of the child's life has for centuries been recognized in a practical way as transitional, in that it represented the time for the beginning of formal education. The actual chronological age differed somewhat with different peoples, but for the most part formal training, as distinguished from home training was begun at the age of six or seven years.

Of China, Douglass wrote (31, p. 165): "School life commonly begins at the age of six, and the youthful learner is at once set to learn by heart easy text-books which give in short sentences the leading principles of Chinese polity." Monroe states that in the old Greek period the Spartan boy was taken after seven years of training under the direct care of the mother and put under charge of assistants to the paedamonus, being cared for from that time on in public barracks at public expense (56, p. 74). Similarly, Athenian boys began attendance at school at about the age of seven years (56, pp. 82-3). Plato, in his ideal Republic would have the boys taught music and gymnastics from the age of seven on (56, p. 135). Medieval and modern education have fallen into line. The legal age for school entrance in most states, and in most countries also, at the present time, falls within the sixth or seventh year. Thus in the educational practice of most nations it has been found experimentally that at about this time of life the child has reached such a stage of development that he can undertake the tasks involved in education of a formal nature.

If, now, we turn attention to the more tangible evidences of the stage of development, we are led to several considerations. There are the matters of growth, both in height and weight, dentition, growth of various parts of the body, including skull, brain, larynx, eye, etc. Another group of facts also, related both to neurological structure and to psychology may be added. These have to do with the neuro-muscular control of the child. Finally, a few suggestions may be obtained from the field of pathology.

Height and Weight.—As regards growth in height and weight, it is generally agreed that the closing years of the later childhood period are years of retarded growth. This conclusion is based upon the results of numerous extended investigations. Conclusions regarding the earlier years of the period are much less definite, partly because of insufficient data, partly because of a difficulty in interpreting the meaning of the growth curves for these years.

Burk, who summarized the available statistics up to the time of his study, 1898, writes as follows (17, p. 257):

> "If now we turn to Table A of heights, taking, for example, the larger American studies of Bowditch, Peckham and Porter, we see that the rate of growth is somewhat rapid in the beginning, the sixth or seventh year, and decreases with fluctuations until about ten years in girls and twelve years in boys, when the prepubertal acceleration sets in. This general decrease is to be noticed in all the larger studies, though the year of the beginning of prepubertal increase varies a year or so. The same decrease in rate from six years up to the time of the prepubertal increase is to be observed similarly in the case of girls. Curves constructed from absolute annual increases show, as a rule, in this childhood period one or two pronounced fluctuations, but they do not occur with a regularity in all charts sufficient to be of assurance that their cause is certainly physiological and not merely statistical. Nevertheless, it will be observed that the curves are by no means regular. . . ."

Although pointing out thus clearly the irregularities in the curve for these early years, Burk goes on to conclude that, in the absence of determinative data, it is perhaps better to regard the period from about six years on as one of a general decrease in growth rate, with one or two minor fluctuations. The investigations of Combe, Landsperger and Carstadt, made upon a comparatively small number of children, but more upon an individual plan, are pointed to as justifying this view (17, p. 258).

Smedley, in the Chicago investigations, noticed something of these irregularities in the early school years. Following his reference to the pubescent acceleration of growth, he writes (84, p. 32): "The charts seem to show that a similar but less well marked period of activity is present from the beginning of school life to the age of nine."

Englesperger and Ziegler (32, Bd. 1) found that of the children in the first year of school, those between the ages five years and nine months and six years were noticeably smaller, on the average, than those from six years and one month to seven years of age. The averages for these periods were:

	Boys	Girls
5 yr. 9 mo.—6 yr.=	109.65 cm.	106.25 cm.
6 yr. 1 mo.—7 yr.=	111.66 cm.	110.77 cm.

They found considerable differences in height at this period between half year, and even fourth year groups.

A tabulation comparing the weights of these periods showed that a smaller percentage of those under six years had gained than of those over six years of age. This was on the comparison of weights eight weeks apart at the beginning of school.

Stratz (86, p. 66), in Germany, on the basis of rather limited statistics, agrees with a former author, Bartel, in making the first four years a period of bodily "fullness," the years from five to seven, inclusive, a period of "stretching," or spurt of growth, and the years eight to ten a second period of bodily fullness, preceding a second spurt from the age of eleven to fifteen.

So far as available statistical material is concerned, growth in weight presents a condition similar to growth in height. Without giving the data these tabulations may be characterized briefly, and their indications may be stated. Most tabulations begin with the school age and continue from that time on, thus preventing comparisons with the years that precede. Usually, also, the number of data for the earliest school years are few in number. Again, statistics for weight present an added difficulty in interpretation because of the greater variability in this factor. So far as comparisons of absolute figures may be relied upon, there is only a continuous but variable increase in weight from year to year in the two sexes, up to the age of nine or ten, when a retardation occurs. Boys appear to be slightly superior, throughout the entire course.

There is slight suggestion of a spurt of growth in the beginning school years, but there is not sufficient evidence to establish the point. What is needed here is a collection of more data, beginning with the lower years and continuing through the beginning school years. One cannot see in these studies of height and weight a definite proof of a characteristic of growth at this period. It is a fact, however, that from the larger investigations the results strongly suggest a slight acceleration. It is also to be remembered that most of the tabulations have paid attention to yearly age groups only. Much more accurate would be a comparison of age groups for fourth years or perhaps for months.

The rather indefinite studies of development, as indicated by increase in growth in height and weight, may be supplemented by some more definite facts with regard to individual organs or parts of the body that give more distinct evidence of a nodality at the school age.

Development of Teeth and Jaws.—The period with which we are here dealing is distinctly a transitional one as regards the development of the teeth and jaws. These present a number of phenomena, transitional as well as developmental in their nature, that group themselves about the years in which the change from first to second dentition occurs. Some of these are very evident, others less so, but altogether they make up such a group of developmental processes, so closely associated with each other, and also to other phases of physical and mental development that they deserve to be noted considerably in detail.

Aside from this, there are also other well grounded reasons for dwelling somewhat at length upon this topic. 1. Anatomically, the teeth and jaws are the most important structures in the facial part of the skull. Much of the remaining portion is of rather secondary nature, its purpose being to furnish place for attachment of muscles or to give proper bracing and support for these parts. 2. On the side of physiological functioning the teeth and jaws are extremely important. Upon them devolves a great part of the preparation of food in the process of digestion, not to mention the part they play in articulate speech. 3. Again, from the view point of hygiene, it may be said that columns of good, sound teeth, so located as to bring their chewing surfaces into proper occlusion, are requisites of good health. The absence of these conditions may lead to any of a number of allied disturbances, to which more detailed reference will be made later. 4. Finally, since they occupy so prominent a place anatomically, the form and general outline of the face are to a great extent dependent upon teeth and jaws. It therefore follows that from the view point of esthetics the proper formation and development of teeth and jaws may not be left unconsidered. Thus we may say that from any of the four view points, esthetic, hygienic, functional or structural, development of teeth and jaws deserves the fullest consideration. We shall attempt to consider the topic from all four of these view points in the following paragraphs devoted to it.

While most concerned with the transitional phenomena, so much depends upon preceding and following developmental processes that a rapid review of the entire period of dentition may be of value in setting forth more clearly the characteristics of the transitional period. In this review, it is assumed that the reader's general knowledge of form, names, and composition of the teeth is sufficient to render detailed descriptions unnecessary. Since similar knowledge with regard to the jaws, on the other hand, seems to be less general, descriptions of the principal structures with which we shall need to deal will be included. For the sake of clearness, the facts with regard to development of the teeth will be presented first, then those with regard to development of the jaws. With these two groups of facts before us, we may next proceed to discuss their relationship and its significance, and arrive at some conclusions. With these hints as to method of procedure before us, we turn next to the presentation of the facts.

Although the eruption of the first or temporary teeth from the gums does not take place until some time after birth, the formation of their crowns begins very early in the developing embryonic jaw. Their calcification is already far advanced at the time of birth. The early formation and development of these is somewhat as follows: Above the gums, along the rudimentary jaw of the embryo, there is formed very early a ridge of epithelial cells. At each of the ten points at which a tooth crown is to be formed, a depression or invagination occurs in this ridge, pushing on downward into the jaw in a line, as it were, or tube, and expanding at the end into a bell-shaped structure,—the enamel organ. Gradually the enamel organ grows down over the top and sides of a small mound-like enlargement that rises up from the deeper tissue,—the dental germ. Again a little later the connection of the enamel organ with the epithelial ridge above is lost, enamel organ and dental germ together become isolated from the surrounding parts and enclosed in a " dental sac," and within this sac the two organs proceed to build up the parts of the tooth crown. Out of the soft cells that make up the enamel organ is formed the enamel; out of those of the tooth germ is formed the dentine or ivory of which the inner part of the tooth is composed, and within which, again, is the open cavity containing the pulp.

The transformation of these soft cells into the hard structures of the crown is accomplished by means of the deposition of lime salts within the cells themselves, and is usually spoken of as a process of calcination or calcification. The processes are not the same in both cases, however. While the cells of the enamel organ become changed into solid crystals, those of the dental germ receive the lime deposits only around the outside in such a way that the resulting structures are elongate tubes. The central, uncalcified portions remain as fine fibrils which are connected with the soft pulp of blood-vessels and nerves that fill the inner cavity of the tooth. The dentine tubes thus formed are of considerable length and extend outward radially from the pulp cavity to the enamel " roof " of the tooth.

The direction in which the calcification proceeds differs in the two organs. It will be remembered that the enamel organ folds over and encloses the dental germ. Now, the calcification begins at the contiguous surfaces of the two organs and proceeds in both directions. For the enamel cells, then, calcification proceeds from the inner surface toward the outer; for the dentine cells, it proceeds from the outer surface inward toward the pulp cavity.

Enamel and dentine differ also in another way. The enamel crystals receive no more nourishment after being once formed. The dentine cells, on the other hand, continue to receive some nourishment throughout the life of the tooth by means of the soft fibrils in the central tubular portions. (63. p. 31.)

As the development of a crown proceeds beneath the gums there is deposited around it a layer of bony substance, so that by the time it is completed it is almost enclosed in a bony case or crypt. The top of the crypt is open, though the aperture is not large enough for the crown to pass through without absorption of some of the tissue from its edges. This is what occurs at the time of eruption of the crown.

After the manner thus described there are formed ten tooth crowns in each of the jaws. Their calcification is not entirely completed by the time of birth, but it is completed within the first few months of life. Then they emerge from the gums to form the " temporary set " that functions during the early years of the child's life. Of these, the incisors and canines are small, as compared with the corresponding teeth that follow. The bicuspids, or milk molars, on the other hand, are larger than the permanent bicuspids that follow. In this way ample provision is made for the mastication of such foods as the child is able to digest and assimilate during his early years.

Some weeks after birth the crowns of the temporary set are completed and begin to erupt from the gums. The first become visible at about the sixth to eighth month of life, usually, and at the age of about two and one-half to three years the child is equipped with a full set of twenty. Appearance is usually in groups, beginning with the central incisors and proceeding, in a general way, backward from these, with intervals of time elapsing between the several groups. Witzel reports the usual time for the eruption of these, as given by Thomas and Baume, to be as follows (98, p. —):

Central incisors	6- 8 mo.
Lateral incisors	6-12 mo.
Anterior bicuspids	12-16 mo.
Canines	15-20 mo.
Posterior bicuspids	20-30 mo.

The basis for this statement is not given, no mention being made of actual investigation. The periods given are those within which the eruption from the gums usually occurs. It is possible for the teeth to appear much later, however, and yet be normal. It is also possible for a few of the crowns to be already visible at birth and the teeth be normal, though this is very often the result of diseased conditions.

The process by which a tooth crown erupts is somewhat complex. The edges of the opening in the bony crypt must first be reabsorbed, making room for the crown to push through. The gums that form the covering are next absorbed. While this is going on and the crown gradually pushing upward, additions are made to the root from cells at the base of the crown, and, once the final position is attained, the root becomes fastened into place by the bony tissue built up around it. The root canal remains as a rather wide opening for some time, however, the dentine being built up gradually until the root is solid, except for the narrow canal through which the vessels and nerves are admitted to the pulp cavity.

The tissue built up around the teeth and within which their sockets are found is known as the alveolar border of the jaw or alveolar process. It is developed with the teeth and apparently for the specific purpose of holding them in position. Fuller description of it may be reserved until later. A description of the means by which the tooth roots are firmly fastened within it, however, is in place at this point. This can best be given in the words of Dr. Angle, taken from his paragraph on "Peridental Membrane" (1, p. 122).

> "The peridental membrane is a strong, fibrous membrane forming a close, cushion-like investment of the roots of the teeth, and is the medium of attachment between the alveolar process and the cementum. It is composed largely of inelastic connective tissue, and is richly supplied with nutrient vessels, nerves, cells, and glands. Its function is three-fold:
>
> "First, vital, for the formation of the alveolar process on one side and the cementum on the other.
>
> "Second, sensory, through which the most delicate touch of the tooth is felt.
>
> "Third, physical, holding the tooth in position in the alveolar socket, and resisting the movements of the teeth in the various directions. It also supports the soft tissues about the teeth."

Continuing, Dr. Angle enumerates the kinds of cells of which the peridental membrane is composed as, *1*, fibroblasts, for the formation of fibers of the membrane; *2*, osteoblasts, for the formation of the alveolar process; *3*, cementoblasts, for forming the cementum; *4*, osteoclasts, for disintegrating calcified tissue; and finally, *5*, glands, the function of which is as yet imperfectly understood (1, p. 123).

Malposition of temporary teeth is rare. When it does occur, it is easily corrected, under normal conditions, by means of the pressure from lips and tongue. But while this is true, abnormal conditions may as readily cause the teeth to be moved from their proper positions and thus bring about a malocclusion.

But the temporary crowns are not formed alone in the embryonic jaw. The beginnings of the permanent crowns are also present at a very early stage. Very early in the development of the enamel organ of each of the temporary teeth a second line or tube of epithelial cells pushes down by its lingual side. It appears as a branch of the tube which develops into the enamel organ of the temporary tooth. In structure, too, it is similar, and its development, later, after the manner described for the temporary tooth, results in the formation of the crown of the permanent tooth.

Aside from the ten corresponding to the crowns of the temporary set, there are also six other germs in each jaw, as the beginnings of the molars of the second set. The child at birth, then, has in each jaw the almost completed crowns of the ten temporary teeth and also the germs of the sixteen permanent teeth at various stages of development. The completion of the permanent crowns is of course later than that of the temporary, their time of most rapid growth, according to Pedley (62) being from birth to three or four years of age. Johnson places the critical period for their calcification at from birth to the age of five years, that of the first permanent molars having been begun even before the birth of the child (51).

The time of these processes is given more in detail by Witzel (98, p. 17):

> "The calcification of the crowns of the incisive teeth begins between the first and second year and the calcification of the canine tooth in the third year. In the fifth year of age the tuberosities for the second molar tooth are developed and in the ninth those for the third. About the time of the ninth year no remarkable processes of calcification take place in the crowns, except in the wisdom tooth, but the roots are not everywhere fully developed. . . ."

The ages mentioned are of course only approximate, and vary within wide limits.

From this it follows that from birth to about five years of age is a critical period for all the permanent set, except the wisdom teeth. During this period the dental germs, many of which have begun development at the time of birth, attain their final form, make their most rapid growth and undergo a great part of the process of calcification. In this connection it should be emphasized that when once formed and completely calcified, these crowns are adult crowns, as large as they will ever be, and subject to neither growth nor repair, so far as the organism to which they belong is concerned. Completion of the crowns is accompanied by enlargement of the alveolar border and growth in some parts of the jaw, with considerable redistribution of the inner structures.

Thus far we have noted the principal features in the formation and calcification of the temporary crowns, marked the important changes involved in their eruption and in their fixation into position by means of developing root structures and alveoli, and have traced the important steps in the process by which the permanent crowns are formed, developed and calcified within the alveolar portions of the jaws. Each one of these is a developmental feature characteristic of the earlier years, and constitutes a step in the preparation for the coming of the permanent teeth. The time immediately preceding second dentition is therefore a remarkable one for the child, considered from the view point of his dentition. Within his jaws there are *1,* a full set of twenty functioning temporary teeth, *2,* the practically completed crowns of their twenty successors, many of which are larger, *3,* the completed crowns of the four first permanent molars and practically completed crowns of the four second molars, and *4,* the only partially developed germs of four wisdom teeth or third molars. This is the normal condition of the child's jaws at the age of five or six years. Transition to the second dentition usually begins very soon afterward.

In discussing the eruption of the permanent crowns we may first give attention to the time of their appearance, and then turn to the description of the process by which it is brought about.

Time of appearance of the permanent teeth has been made the object of a number of investigations. Some of these are of no value for our purpose, since they do not differentiate the sexes. Of the three available that do, one is not extended, but the other two are sufficiently so to make their results valuable.

First let us turn to the statistics of Boas and Wissler. Their material was a series of plaster casts taken from the palates of 219 boys and 276 girls. They therefore contain data for the upper jaw only. The following Table A is their table numbered "XI C." giving results in percentages (11, p. 34):

TABLE A.

PERCENTAGE OF CHILDREN HAVING PERMANENT TEETH.

Age	Boys						Girls					
	In. Inc.	Out. Inc.	Can.	Bic.	1st Mol.	2nd Mol.	In. Inc.	Out. Inc.	Can.	Bic.	1st Mol.	2nd Mol.
6	30	4	....	....	65	....	38	9	6	15	83	2
7	40	6	3	3	83	....	79	28	2	41	92	....
8	81	26	....	19	100	....	84	48	9	45	93	6
9	97	67	....	30		7	100	59	9	45	100	2
10	100	63	33	66		3	94	82	14	73		8
11		95	61	100		9	96	96	73	83		20
12		100	85			38	100	100	86	100		32
13			91			68		88	88			68
14			100			66		90	90			90
15						75		100	100			100

Averages and variabilities were computed for the time of appearance of the several teeth and found to be as follows (12, p. 35):

	Boys	Girls
Inner incisors	7.5 ± 1.5 yr.	7.0 ± 1.6 yr.
Outer incisors	9.5 ± 2.1	8.9 ± 2.1
Bicuspids.	9.8 ± 1.6	9.0 ± 2.8
Canines	11.2 ± 1.4	11.3 ± 1.0
Second molars	13.2 ± 2.0	12.8 ± 1.6

TABLE B.

Age in Years	Sex	Number	Inner Incisors		Outer Incisors		Canines		First Premolars		Second Premolars		First Molars		Second Molars	
			Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
5.5– 6.	M	10	2	2	...	...	...	...	...	...	...	...	8	12	...	...
	F	6	...	...	...	...	...	...	...	1	...	...	...	4	...	...
6. – 6.5	M	42	...	13	...	...	...	...	...	...	...	...	26	50	...	...
	F	33	7	20	...	...	...	...	2	...	...	...	28	41	...	...
6.5– 7.	M	115	30	115	1	13	...	...	3	1	3	1	166	173	...	...
	F	140	50	147	4	33	...	1	3	3	2	...	211	242	...	...
7. – 7.5	M	97	44	145	3	26	...	...	1	...	...	...	179	182	...	...
	F	117	81	191	15	65	...	...	3	2	1	...	215	224	...	...
7.5– 8.	M	114	107	207	19	89	...	2	10	4	...	1	217	222	...	...
	F	119	174	224	47	116	1	2	15	3	3	...	233	233	...	...
8. – 8.5	M	101	157	194	55	125	...	5	21	3	2	3	193	194	...	...
	F	110	193	216	87	163	2	12	34	11	10	9	214	218	...	1
8.5– 9.	M	129	213	243	117	196	2	1	35	10	20	8	255	255	...	...
	F	117	217	229	145	189	9	17	62	28	17	15	233	232	...	...

9. – 9.5	M	124	228	243	167	220	1	17	72	32	21	15	**248**	**248**	. . .	. . .
	F	130	258	258	210	249	26	60	96	66	30	27	**260**	**260**	1	3
9.5–10.	M	134	262	266	239	259	9	27	111	57	48	34			1	6
	F	139	273	277	249	273	26	79	131	83	54	43			7	17
10. –10.5	M	115	**230**	229	207	227	18	34	107	70	59	44			4	8
	F	120	**240**	**240**	232	238	53	116	154	131	91	77			10	32
10.5–11.	M	112	**224**	**224**	209	222	35	68	136	86	92	51			14	36
	F	136	**272**	**272**	261	**272**	95	175	184	140	115	94			29	61
11. –11.5	M	119			227	**238**	70	137	140	127	109	73			26	62
	F	125			244	249	130	200	180	180	150	132			49	113
11.5–12.	M	116			227	**232**	83	149	181	144	133	91			46	74
	F	138			272	274	149	225	237	220	188	153			91	154
12. –12.5	M	128			253	**256**	151	110	222	210	189	151			127	161
	F	134			261	267	198	245	240	229	191	171			108	157
12.5–13.	M	97			193	**194**	132	165	181	160	150	133			113	145
	F	105			209	**210**	161	192	204	184	169	150			123	154
13. –13.5	M	59			**118**	**118**	94	106	110	98	104	95			91	105
	F	64			126	**128**	112	**128**	126	123	121	116			105	120

The investigation of Berten was much more extended. He collected data from some 3,345 children in Germany, of ages ranging from five and one-half to thirteen and one-half years. In the accompanying Table B are presented the numbers of teeth present for each half-year group within these ages. This table condenses the data found in Berten's tabulation (8, pp. 278-9). Boldface figures indicate groups where 100 per cent. were found present.

A report of an investigation much more extended than either of these appeared in recent years. Dr. Röse has tabulated the number of teeth found present in the several groups in case of 41,021 children in Germany, Sweden, Denmark, Holland, Belgium, Bohemia and Switzerland. His tabulation differentiates upper and lower teeth, also sex groups, and gives the averages and variabilities for the several tooth groups.

Table C is his "Table XIV," in which the results of the investigation are summarized (77, p. 564):

TABLE C.

Eruption Time of Permanent Teeth in 41,021 School Children from Germany, Sweden, Denmark, Holland, Belgium, Bohemia and Switzerland.

	Boys=21,139			Girls=19,882		
	Average eruption time		Eruption time varies between ages	Average eruption time		Eruption time varies between ages
	Yr.	Mo.		Yr.	Mo.	
UPPER JAW						
Incisor I...	7	8	5.5–11.5 Yr.	7	5 (–3 Mo.)	5.5–11. Yr.
Incisor II...	8	11	6. –(?) "	8	6 (–5 ")	6. –(?) "
Canine.....	12	2	7.5–15. "	11	7 (–7 ")	7. –15. "
Premolar I.	10	5	6.5–14. "	10	1 (–4 ")	6.5–14.5 "
Premolar II.	11	4	6.5–15. "	11	1 (–3 ")	7. –15. "
Molar I....	6	7	5. – 9.5 "	6	6 (–1 ")	5. –10. "
Molar II....	12	9	9. –15. "	12	5 (–4 ")	9. –15. "
LOWER JAW						
Incisor I...	6	10	5. –10. Yr.	6	7 (–3 Mo.)	5. –11. Yr.
Incisor II...	7	11	6. –12. "	7	7 (–4 ")	6. –12. "
Canine.....	11	2	7. –15. "	10	3 (–11 ")	7. –14. "
Premolar I.	11	3	7. –14.5 "	10	8 (–7 ")	7. –14.5 "
Premolar II.	12	0	7. –15. "	10	7 (–5 ")	7. –15. "
Molar I....	6	5	5. –10. "	6	3 (–2 ")	5. – 9. "
Molar II....	12	3	9. –15. "	11	9 (–6 ")	8. –15. "
Avg. of the total 14 eruptions.	9	10.0		9	5.4 (–4.6 Mo.)	

Careful study of these tabulations will show that they are in agreement as to the essential points regarding the time and the order of eruption of the permanent crowns. Each one confirms the prevalent view that transition to second dentition begins with the eruption of the first permanent molars. This is evident in the tabulation of Berten, and in the averages from the very extended investigation of Röse. Berten writes that in only three cases did he find the transition to the permanent teeth beginning before the appearance of any molars (8, p. 271).

Incidentally it should be noted that the time for the appearance of the first molars is in the seventh year. Berten's table indicates that practically all appear between the age of six years and seven and one-half, while Röse's averages all fall between the ages six years and three months and six years and seven months.

Again, the more extended investigations of Berten and Röse have furnished abundant evidence in confirmation of the view that the lower teeth appear, on the average, earlier than the upper, except, perhaps, in case of the canines and bicuspids. In all the investigations a considerable variation in the time of appearance for the several tooth groups is evident. From this it follows that dentition does not run a parallel course in all children. Variation in time of appearance is least in case of the first molars and grows progressively greater with each succeeding tooth group, up to the bicuspids and canines.

The order in which the permanent crowns appear is represented in these data. According to them it runs: first molars, inner incisors, outer incisors, first bicuspids, after which the order of the remaining groups is somewhat confused. Berten states (8, p. 274) that most often we find these groups appearing in such a way that the lower canine follows the first bicuspids, and is followed, in turn, by the upper second bicuspid; then the lower second bicuspid appears, and the upper canine brings up the rear.

Finally, before leaving this topic, the point of sex difference in time of eruption of the teeth should be pointed out. In each of the three tabulations it is clearly evident, beginning with the first molars, at the very beginning-time of second dentition. Röse's results show the girls to be two months earlier in eruption of lower first molars; one month ahead in eruption of upper first molars, on the average. The actual difference of time is not so evident in Berten's table because of the form in which it is presented, but comparison of the numbers of the teeth present show that the results would be in agreement. Presented in the form of curves showing the percentages of teeth present in the various groups, Berten's data show very clearly that this is true.

The processes by which the eruption of the permanent teeth is accomplished deserve some further consideration. Evidently the temporary structures must first be disposed of. This is the first step in the eruption of the permanent set. It is accomplished by a sort of reverse process to that by which the temporary roots are builded down and fixed within the alveolar border. Beginning at the lower parts, the roots are again reabsorbed, along with the bony case of their sockets, even before the term of functioning of the teeth is completed. Radiographs showing partially reabsorbed roots present very much the same appearance as those showing partially developed ones. Apparently the reabsorption, or resorption, as it is often called, is incited by the pressure of the developing permanent crowns below. At any rate, in normal cases the process is sufficiently advanced by the time the permanent crowns are ready to appear to allow the temporary tooth to be readily removed with very slight disturbance and very little pain.

Evidently here are processes in which the different types of cells in the peridental membrane described above, especially the osteoclasts, play a very important part. Pedley and Harrison (63, p. 52) would credit the leucocytes with an important part in the resorption process also.

Aside from the resorption of the temporary roots there is also a process of resorption of the cancellated tissue that surrounds the deeply embedded crowns, allowing for their passage upward toward the surface. In case of the molars, this includes the absorption of part of the cortical bone along the borders of the jaws where there have been no preceding temporary teeth.

The growth process by which the crowns emerge, making additions to the roots while so doing, is not essentially different from that of the temporary ones already described. Building up of the roots seems to be a somewhat slower process in this case, and their final cementing into place more permanent. This latter is rather an osseous change and will be mentioned more in detail later, but it should be noted in this connection that the order is always first tooth position, then adjustment of foundation. This is true regardless of whether the position assumed is normal or abnormal. The bony foundation builds to the tooth, whatever may be the position it assumes.

Again, difference in size, especially of incisors and canines, is greater in the upper than in the lower jaw, so that readjustment of the two columns of teeth to each other becomes necessary. This is a fact of considerable importance for the normal occlusion of the teeth of the permanent set. Whereas the upper and lower teeth of corresponding names fit end to end in the temporary set, in the permanent, the greater size of the teeth in the upper column cause a backward shift along the sides. The normal condition is therefore for each molar and bicuspid to articulate, not with a single antagonist in the other jaw, but with two teeth.

So much for the phenomena of dentition. The treatment is inadequate, but possibly sufficient facts have been presented in this brief review to indicate that the beginning of later childhood is without a doubt a transitional period as regards the teeth. Preceding this period time and material are both devoted to the task of providing temporary structures and preparing permanent crowns; with the eruption of the first molars at this period, however, is ushered in a series of remarkable changes, every one of which is a step in the direction of dental maturity. Dr. Port (65) stated the case nicely when he referred to this period of life as one at which, for the dentist, the child becomes adult. The significance of these phenomena becomes greater when they are associated with others closely allied to them, and, in a way, depending upon them. To some of these we shall next give attention.

Paralleling that of the teeth, there must occur a progressive development of the bony arches of the jaws that form their foundations. Structurally, both jaws are complex, and are in very close relationship to the other parts that make up the facial portion of the skull. Thus the upper jaw forms the principal bone of the face, taking part in the formation of the hard palate, the floor of the orbit and the floor and lateral wall of the nasal cavity (71a, p. 50). Cryer states (27, p. 31) that in a surgical operation removing a right or left maxilla, " the inferior turbinate, portions of the lachrymal, the palatal, the malar, and the ethmoid bones will probably be removed with it." The lower jaw, on the other hand, has the distinction of being the strongest and thickest bone of the face. It is made up of the arched portion known as the body, and the two ascending portions called the rami, each of which has a flat, pointed projection at its anterior edge for the attachment of muscles, and at the posterior edge a convex process which hinges with the forward portion of the temporal bone and allows for the movements of the jaw.

Leaving aside for the moment the details of structure, we may generalize with regard to the arched portions of the two jaws by saying that in either case, the essential features are (1) a basal osseous arch composed of an outer shell of cortical bone filled in with spongy, cancellated tissue, and (2) an alveolar border consisting of two thin, hard, compact plates, an inner and an outer, fitting close to the roots of the teeth, between which is the looser cancellated portion surrounding the roots of the teeth, and within which the more compact, shell-like cases surrounding the roots are contained. The whole arrangement of the jaws, both with reference to each other and to the remaining portions of the face and skull, is such as to withstand the strain of muscular contractions in chewing, and at the same time protect against forces from without, such as blows, by diffusing them in a way to prevent their being transmitted to the brain case (27).

As already intimated in a previous paragraph, the development of the jaws begins very early in the embryo. According to Quain's Anatomy (71), the order for the beginning of calcification of the bones is : first, the clavicle; second, the inferior maxillary (mandible) ; and third, the superior maxillary (maxillae). The Text-Book of Cunningham places the beginning at about sixth or seventh week of foetal life (28, pp. 144-5). Witzel would seem to agree as to time, since he published a plate (98, plate 3), showing calcification of the mandible in a foetus of six weeks.

In case of either jaw, calcification begins in a number of centers which later unite. The final completion of this process does not occur in the mandible until some time after birth (usually during the course of the first year), when the two halves unite.

Extended and accurate investigations of the growth of the jaws from this time until the beginning of second dentition are very few. On a few points, however, authorities seem to be in agreement, so that we may characterize in a general way the principal developmental features of this period. Naturally we turn first to longitudinal growth. After the completion of the first year, or at least after the completion of first dentition, there is little or no growth in those portions of the arches containing the temporary teeth. If any occurs at all it is very small in amount. With the appearance of the teeth there is a lengthening of the ascending portions of the lower jaw, thus making room for the teeth and their alveolar borders. The relationship of this development to the order of the appearance of the teeth constitutes one of the nice adjustments of nature, as Pedley and

Harrison (63, p. 42) have pointed out. In general, the order of tooth appearance is from front to back. By this means time is gained for the growth in the length of these branches, while at the same time there is not left an "open bite" in the middle of the arch.

As regards internal structure, arrangement of the fine bony particles or trabeculae remains for the most part regular, though there are some changes having to do with strengthening the jaws and adjustment to the developing crowns of the permanent teeth (98).

The rapid growth of the jaws at the time of second dentition is a well known fact. It is evident in the changed proportions of both jaws and face, with the resulting change in facial expression, and is also inferred from the fact that the second set contains a greater number and, to all appearances, larger teeth.

Growth is largely dependent upon the development of the teeth, and is therefore not uniform in all parts of the jaws. A number of investigators have attempted to answer the question as to whether there is any longitudinal growth in those portions of the arches bearing the temporary or deciduous teeth at the time of second dentition. Zsigmondi (106) reports the results from a long series of these investigations, and in addition describes an investigation of his own, in which, by the use of plaster casts, he employed a new method, obtaining records of the same jaws at different stages of their development.

Difficulties of method are everywhere apparent, not the least of which is that the measurements give a record, not of the differences in the basic part of the jaw, but rather of those in the dental arch or the alveolar border only. Referring in part to the results reported by Zsigmondi, in part to the original articles themselves, and comparing carefully, it seems only safe to say that there is not conclusive evidence that any longitudinal growth occurs in that portion of the alveolar arch lying between the first permanent molars during the period of second dentition. Since this is true, there is likewise no evidence to show that longitudinal growth occurs in the basic portions.

That the dental arch in the upper jaw becomes larger is not disputed, but attention is called to the fact that here the teeth with their alveolar border slant outward, while in the lower jaw they slant rather inward, so that the question of longitudinal growth of the basic part of the jaw is still left unanswered. Besides, the question as to the presence or absence of growth is most often raised with reference to the lower jaw, the result being that most investigations have had to do with it, and have secured data pointing more or less to conflicting conclusions. However, while conclusive proof is lacking, there is not general agreement that growth does not occur. More recently Cryer (27, p. 14), who bases his conclusion upon the study of the anatomical arrangement of the inner structure of the mandible, has declared in favor of growth. Angle also seems to hold this view (1, p. 91).

While growth in the " deciduous arch " is still questioned, on one other point authorities are agreed. While the permanent incisors and canines require a greater amount of space than their predecessors, the greater requirement is partially compensated for by a lesser space requirement on the part of the permanent bicuspids, which are smaller. The actual need for growth in these portions of the jaws is therefore much less than it would be were the permanent teeth uniformly larger than their predecessors. The compensation is much less nearly complete in the upper than in the lower jaw, thus giving a second partial explanation of the fact that the upper permanent dental arch is apparently larger, while the increase in the size of the lower is questioned.

Let us turn attention next to the posterior portions of the jaws. It should be noted first that authorities generally agree that growth of these portions is dependent upon the development and eruption of the molar crowns. In either jaw the growth must be sufficient to make room for the three molar teeth on each side. The development of these crowns seems to be the signal for growth of this portion of the jaws. This is especially noticeable in the lower jaw. " The cutting of the first molar tooth and the formation of the crown of the second cause in the following years of life a strong longitudinal growth of the maxillary body, . . ." writes Witzel (98, p. 59).

As in case of the anterior portions of the arches, there is much disagreement as to the exact process by which the increase is brought about. Some authorities, such as Cryer, hold that growth is general along the jaw and that each erupting crown pushes the ones anterior to it forward (27, p. 14). Others take the position that the growth is only at the extreme posterior portion, and that much of it is due to absorption and deposition of the bone substance. Humphry quotes Tomes (48, p. 3, footnote) to the effect that these processes are shown by the examination of the histological structures at time of growth. Humphry also tested the growth in the lower jaws of young pigs by piercing the ascending portions and tying wires about the anterior and posterior borders. Later, when the pigs were killed, the wires at the anterior border were found to have either become loosened or dropped out, showing that resorption of bone had taken place, while the wires at the posterior borders were found in deeply indented notches formed from the progressive deposition of bone above and below them (48, p. 3 ff.).

Besides the horizontal growth in the arches of the jaws, adjustment to the greater space required between them to accommodate the larger permanent set is accomplished by means of a growth in the length of the ascending portions, or rami, of the mandible. With the longitudinal growth downward and backward the angle of the jaw becomes more acute, approaching a right angle, though this is apparently due in part also to the development of the teeth and alveolar border.

Finally there may be mentioned a group of changes of inner structure. Rearrangement of the teeth brings about a necessary redistribution of their neural and vascular supply. Increase of masticatory surface, accompanied by a growth in strength of the muscles used in mastication, causes a strengthening of the basic portions of the jaws; lastly, as a result of rearrangement of the lines along which the forces are exerted in mastication, as well as of growth, there occurs a new arrangement of the bony trabeculae within the jaws to adapt to the new conditions.

In addition to that of the jaws, some other developmental factors appear to be very closely related to dentition. Possibly most prominent among these is the growth of the face, due in part, of course, to the increasing size of the jaws. West found in his Worcester investigation (97) that there are pretty distinct periods in the development of the female face, the first division point being at about the seventh year. Transitions from one type to the one next following seemed to be rather abrupt. Röse found from head and face measurements of more than 45,000 children of different nationalities that the face lengthens much more rapidly during the time of change of teeth than it does in later years (75, p. 711). Facial index increased in length some three and one-half degrees between ages seven and thirteen (75, Table 5, p. 706).

Greater masticatory ability seems to be accompanied by an inner psychic change. Bell (7) found in his study of the psychology of foods that taste becomes "mentalized" at about the age of seven as it has never been before. He speaks of this as a stage of "teasing to taste." He found also a tendency to make every possible mixture at this period, and an increased interest in medicine, with a tendency to taste it.

Dr. Wright (100) finds that periods of enlargement of the tonsils without inflammation coincide with the times when the groups of molars are erupting. He finds that after giving the tonsil prophylactic treatment, when necessary, and waiting for the tooth to erupt, the return of the enlarged tonsil to the normal will follow in a high percentage of cases. Disappearance of abnormal tonsilar conditions also follows the treatment of carious teeth in many cases.

He contends that tonsilar enlargement without infection is but an expression of the normal functioning of lymphoid tissues in that region, especially active at times of tooth eruption because of additional requirements in the way of caring for waste material which results from rapid bone resorption, etc. The second period when this condition is liable to be present coincides with that for the eruption of the first permanent molars, and therefore in a general way also with the period of life in which we are here especially interested.

One hesitates to leave this topic without dwelling for emphasis upon the importance of dentition for development at the beginning school age. Referring to the relationship of the teeth to nutrition, Crampton (26, p. 354) has spoken of tooth appearance as " the indication of successful growth and the earnest of further preparation for growth."

Again, importance of dentition stands out clearly when one takes into account the number of conditions by which its progress is affected. The great variation in time of appearance has been noted. There are many explanations for this. Early or late dentition have often been charged up to heredity, and facts regarding the first set, such as those presented by Holt (45, p. 28) and Rosenhaupt (79) would seem to indicate that there is reason for doing so. Röse has found that permanent teeth appear earlier among Swedish than among German children, thus showing the influence of race (77). He would also credit the chewing of coarser foods with some influence in this case. Again, in the same investigation, Röse found dentition earlier in children of the higher schools than in those of the Volkschule, and earlier in children of city than those of rural communities. This is explained as due to differences of nourishment, and to some extent to better racial selection also. The importance ot nourishment while the crowns are developing, therefore during the first five or six years of life, is emphasized by many authorities. Bell (7), without giving his authority, states that it is reported southern children erupt their teeth earlier than northern. Finally, it is recognized that diseases influence dentition. Holt (45, p. 28) says syphilitic children are prone to early dentition, in which case rapid decay is likely to follow. Rickets is usually credited with having a retarding influence. Röse tested this (77, p. 569) by comparison of children with normal teeth and those with hypoplasia, or deficiency of enamel. Among 10,020 children, he found a slightly later eruption time in the latter group. Latest dentition is seen in cretinism (45, p. 29).

The complexity of the problem is evident. Berten says (8, p. 267) that whoever has given only slight attention to the eruption of the teeth will have found that the time varies with race, climate, sex, constitution and disease, and in part to sports of nature.

Composition of the tooth crowns is apparently affected by many of the same influences, especially conditions of nourishment and disease. Lack of lime in food and water may cause poor dental structures, with deficient enamel, and therefore poor protection. Dr. Burnham (18, pp. 296-7) reports a number of investigations indicating that regions poor in lime show a high percentage of carious teeth. Pedley and Harrison (63, p. 47) emphasize the use of the teeth as beneficial, in that it increases blood supply and thus brings more nourishment. The disease of rickets apparently deprives the teeth of sufficient lime salts, being accompanied usually by hypoplasia, a condition in which the enamel is deficient.

Finally, we may cite the response of the organism to dental conditions, as evidence of the importance of the latter at the school age. Among others, Jessen (50, p. 1) quotes these conclusions from Röse's "*Zahnverderbniss und Zensur*" (*Deuts. Monats. f. Zahnheilk.*, 1904):

"*1.* The physical development of school children is greatly influenced by defective teeth. *2.* The poorer the physical development, the poorer also is the mental power ("Spannkraft") of the children. *3.* The poorer the teeth, the worse are, on the average, the grades of the children." In his article on the "Hygiene of the Teeth" Dr. Burnham writes (18, p, 298): "Of the various disorders frequently caused or aggravated by decaying teeth are not only enlarged glands of the neck, headache, neuralgia, earache, but indigestion, heart trouble, irritation of the nervous system, epilepsy, and perhaps chorea and other neuroses."

Preservation of a full set of sound temporary teeth and regulation of their positions when necessary are requisites for proper development of both teeth and jaws at time of second dentition. Premature extraction, too long retention, caries or malocclusion in case of the temporary set may be the cause of improper development of the jaws with impaction or with abnormalities in position of the permanent crowns.

Some experiments upon animals would seem to indicate the dependence of proper development in jaws and face upon a full set of functioning teeth. Walkhoff (92) cut one temporal muscle of a dog four weeks old, compelling him to chew only on the other side. Within three months a difference between the development of the two sides of the jaws could be detected, and at the end of a year the functioning side was much larger and stronger than the other. Dr. Baker (5) performed a similar experiment by grinding the teeth of young rabbits, preventing occlusion in one-half of the jaw. Not only the jaws, but the parts of the skull to which the muscles of mastication were attached showed the effects by their greater size and strength on the functioning side. The unused sides remained undeveloped. The prepared skulls showed a distinct asymmetry.

While emphasizing the point that the presence of all the teeth is essential, Dr. Angle has stated (1, p. 17) that, "in function and influence some are of greater importance than others, the most important of all being the first permanent molars." He explains further that this is true because, *1.* they are largest and firmest in their attachment, *2.* they have the most important location in the arches, *3.* their length determines the separation of jaws and length of bite, thus contributing to facial proportions, *4.* they are first in position and influence other tooth positions, and *5.* they are most constant in time of eruption and in the assumption of normal positions.

From all these facts, and especially in view of the close relationship of tooth development and nutrition, it must follow that dentition is a matter of prime importance in the early years. It would perhaps not be too much to say that, from among all the factors which may and should be considered for such a purpose, dentition is the best single indicator of the stage of physical development which a child has reached at any time during these early years, or, as some would state it, of physiological age.

Having dwelt somewhat at length upon this very important phase of development, we may bring together the principal points in this brief summary:

1. The development of the teeth and the parts closely related to them, particularly the jaws, give evidences of a transitional stage at about the time of the beginning school years. The loss of the temporary and the eruption of the second, permanent, more numerous, adult-sized set of teeth is begun at this time, producing a new, different method of articulation. This is accompanied by rapid growth in certain portions of the jaws, with considerable rearrangement of the inner structures, resorption and deposition of bone substance, etc.

2. Normally, the transition is begun by the eruption of the first permanent molars, at about the seventh year, after which temporary tooth groups are replaced by the permament in the order; inner incisors, outer incisors, first bicuspids, with canines and second bicuspids following in variable order, and followed in turn by second molars. Wisdom teeth come much later.

3. The time of tooth appearance in different children shows considerable variability, beginning with the early years, clearly evident at the time the first molars erupt, and increasing rapidly with the progress of dentition thereafter.

4. Sex differences are apparent in the eruption time of the permanent teeth, those of the girls appearing earlier, on the average, than those of boys. Here also, the difference increases with the progress of dentition.

5. The vital significance of dentition as a factor in development is shown by its close relationship to nutrition, by its close relationship to the growth of other parts, such as jaws, face and skull; by the many influences, such as nutrition, race, sex, etc., by which it is influenced; and by the reaction of the organism to dental conditions as shown in physical development, mental power, and the like.

6. These things being true, it follows that the state of advancement reached in dentition is a good indication of the stage of progress which a child has reached in his total physical development. The transitional features described therefore take on an additional significance.

Growth of the Skull.—The period of life under consideration is apparently transitional as regards the growth of the skull. In Quain's Anatomy (70, p. 82) we read:

> "The skull grows rapidly during the first seven years of life. By that time, certain parts, including the circumference of the occipital foramen, the body of the sphenoid, the cribriform plate, and the petrous division of the temporal have attained their definitive size. The other regions also increase but little until the approach of puberty, when a second period of active growth begins, affecting especially the face and frontal portion of the cranium, with which is associated the expansion of the frontal and other air sinuses."

These facts become the more interesting when we recall that cessation of growth in these portions occurs at just about the same time as the beginning of more rapid growth in parts of the face, as previously described, and as demonstrated by West (97) and by Röse (75).

Growth of the Brain.—Data with regard to the size of the normal brain at different stages of development are meagre. Aside from this, there are many difficulties which arise from unavoidable inaccuracies in methods of sectioning and preparing specimens, and also from the fact that individual variations are great. Averages of brain weights are therefore of doubtful value.

It is generally agreed that the early years are years of very rapid gain in brain weight. There are no data, however, to show beyond question that a distinct nodality occurs at the beginning of the later childhood period. Curves for brain weights at different ages can only be said to suggest that this is true. Pfister is reported to have found that the brain weight at the end of the sixth year is not infrequently equal to that of the adult (71, p. 342). This is also observable in the tabulation of brain weights collected by Vierordt (90, pp. 36-37). Donaldson, in his study of the brain was led to conclude, largely on the basis of the curve for brain weights collected by Vierordt, that, ". . . . By the seventh year the encephalon has reached approximately its full weight, the subsequent increase being comparatively small . . ." (30, p. 104). We may say, therefore, not that brain weights show, but rather that they suggest a transition from rapid gain in gross weight to a different mode of development from the school age onward. This suggestion is strengthened by the fact that the rapid growth of the skull ceases at about the same time. Again, psychological investigations seem to show for this period a rapid development of muscular control, and the like, suggesting development along the line of better inner organization rather than by means of mere addition of material.

Development of the Eye.—Embryonically, the eye develops as a specialized portion of the brain. It is therefore interesting to note that there is some indication of its having attained approximately adult size at the same time with the brain. Stratz (86, a) has noted the relatively large size of the eye as compared to the small face of the child in the early years, due in part, of course, to the rather late development of the facial portions. The statement of Merkel would indicate that there is a further possible explanation. Without giving data, he says (55, Vol. 1, p. 256): "In connection with the development of the whole eye-ball, it occurs that the horizontal breadth of the iris is already reached in the sixth year of life." Parallel to this fact—provided data may be found to support it as fact,—there occurs at about the school entrance age a transition in power to use the eye and also to control its movements.

An important factor is the power to employ binocular vision. In this is involved the ability to "fuse" the slightly different images from the two eyes and interpret them as one object. This begins in the first few weeks of life, and according to Miss Sayer (82), is usually complete about the sixth to ninth year of life. In learning to overcome the difficulty, the child has a tendency to "squint," but overcomes it after learning to use the eyes properly. From defects of vision, however, he may develop a permanent "squint." This is easily cured by means of the amblioscope if taken before the age of six, but otherwise it develops, as does stammering, into a pathological condition that is very difficult to cure. The statement of Dr. Cornell (23, p. 243) with regard to this condition is in agreement with that of Miss Sayer. Again, while largely dependent upon central brain structure, there should be mentioned in this connection the lack of power to retain visual imagery in case of those persons who become blinded earlier than the fifth to seventh year (49).

Here, again, phenomena which apparently involve both visual organs and visual brain centers would seem to suggest strongly that the closing years of earlier childhood constitute a time of change, both with respect to structural development and functioning.

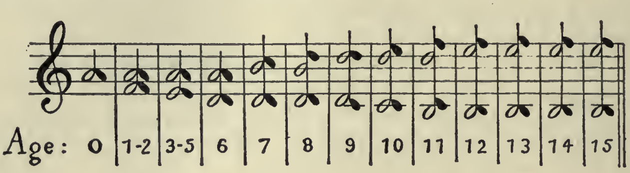
Larynx and Voice.—Vocal organs and vocal powers give evidence of a nodality of development at beginning of the later childhood period. Of the larynx Barth (6, p. 86) writes:

> "In the first two years of life the growth of the larynx is very slight. With the active use of speech in the following years the growth progresses more rapidly. It appears, however, to be limited more to the muscles that move the vocal cords. From the sixth to the fourteenth year of life the growth of the larynx is almost stationary again, or, if it is present, is very slightly noticeable, strikingly and disproportionately less noticeable than the growth of the remaining organs of the body."

Cunningham's Anatomy makes a similar statement (28, p. 972):

> "In the newly born child, the larynx, in comparison with the rest of the body, is somewhat large (———) and it continues to grow slowly and uniformly up to the sixth year of childhood. At this period there is a cessation of growth, which persists until puberty is reached, and then a stage of active growth supervenes."

Gutzmann's diagram of the averages for normal children of both sexes up to the age of fifteen (37, p. 51) indicates a rapid widening of the range of voice, beginning at the age of seven. Differentiation of the sexes is also shown at this time, the range for girls being wider than that for boys from this age onward. The diagram is as follows.



Neuro-muscular Control.—Differences in the power to control bodily organs indicate a transitional period at six or seven years. Speech development also gives such an indication. Apparently this period marks a stage of completion in speech coordinations, since infantile babble, if continued after this time, is usually considered pathological (22). Control of visual organs, as previously described, gives a similar indication. Unless corrected before this period, "squint" becomes permanent. Vocal power, on the other hand, as indicated by the range within which pure tones can be sung, shows a rapid increase from this time on (37). The two sexes also show a difference in breadth of range from this period onward, at least up to the pubescent years. Bryan's tests of precision in finger movements (14) showed that in both the "up" and "down" writing movements almost half the gain between the ages of six and sixteen was made between the ages of six and eight years. Halleck has stated, "The vital time for motor training is before the age of eight" (40, p. 835).

Pathological Conditions.—Some pathological conditions may be grouped together to show a relationship to this period of life. Stuttering, which differs somewhat from the infantile babble previously referred to, has been shown to be more prevalent at seven to eight years of age. Conradi (22) believes there is a causal connection between this and dentition. Jastrow (49) found among some 200 persons in institutions for the blind that those who had lost the power of sight previous to the age five to seven years did not retain visual imagery in their dreams in after years. Those blinded later than the age of seven, on the other hand, did retain visual imagery. Clouston, in his "Neuroses of Development" (21½), long ago observed that the age of seven or eight is a time when many neuropathic conditions are liable to break out. In this connection again should be mentioned that "squint," also infantile babble are but natural when occurring previous to this age, while if lasting longer they seem to be so deeply grounded as to constitute pathological conditions.

These are by no means proofs, nor is the list complete, yet the suggestion is strong that after this period of life the physical organization is somewhat different from that which precedes.

Mental Development.—Adequate treatment of this topic would make this paper far too voluminous. We can touch it but briefly, stopping only for some general statements, chiefly concerning its relationship to our problem.

Early years have long been recognized as a time of sensory training, shorter attention span, shorter memory span, etc., but no sharp transition has been clearly shown. Mental tests are not yet sufficiently refined to grade accurately small steps of advancement. Individual variations are too great.

Though evidence to the contrary may be found, that there is a correlation of mental and physical development during school life has been indicated in a general way by such investigations as those of Porter (67), Smedley (84), Quirsfeld (72) and Crampton (26). Methods of grading mental advancement with reference to stage of physical development rather than chronological age at this period, however, have yet to be worked out. There is needed here much further investigation, on the individual plan, for the purpose of finding the degree of mental advancement that may be expected in a pupil of either sex who has reached a given stage in his or her physical development. The question arises as to whether such investigation might not show a characteristic of mental development corresponding to the transitions in the physical. Facts of brain growth, neuro-muscular control and the like suggest that this might be true.

Summary.—By way of summary we may generalize with regard to the preceding facts bearing on the question of nodality at the school entrance period as follows:

1. Disturbances of growth in height and weight have been noticed at this period but their nature is imperfectly understood.

2. Dentition shows distinctly a transition at this period, and because of close relationship to other phases of development suggests strongly that it is general in its nature.

3. Both skull and brain show a change in growth rate at about this time of life.

4. Growth of larynx and development of voice range indicate transition in these years.

5. The statements of some authorities with regard to growth of the eye and control of its movements suggest nodality in its development at this age.

6. Phenomena of muscular control, also facts regarding pathological conditions, give evidence of a change in physical organization after this period.

7. A clear-cut mental transition has not been shown, but tests have not related mental to physical stages of advancement. General correlations of mental and physical powers and facts regarding brain growth and muscular control suggest that tests relating these phases would indicate a transition here also.

On the basis of these facts it appears that the question regarding a transitional stage of development at the beginning of later childhood should be answered in the affirmative. The time at which these phenomena occur is of course only approximate, being based upon averages in most cases. The degree to which these changes are interdependent is also unknown. Whether they are all secondary to one basal, radical change, as for example dentition, or whether they represent a more general reorganization to which each is related cannot be stated. It seems probable that the latter is the case, although it is a problem that must be left open. It is certainly one that merits further investigation.

Comparative Development of the Sexes.

If, now, we give attention to the question of the comparative development of the two sexes at the school age, we are led to the consideration of a number of groups of data similar to those of the preceding section.

Occasional statements with regard to differences of the sexes at this early period of life have been made. Tyler (88, p. 139) that girls of six begin to show signs of the precocity which characterizes later development. Röse mentioned differences of sex at time of second dentition (77, p. 555). Stratz (86 a) thought sex differences in bodily form first become evident at the age of six, after which girls show more grace of curve, boys more of angularity and strength. For the most part, however, it has been taken for granted that the development of the two sexes is the same until some time after this period of life is passed.

In an article published at a time when this study was near completion, Dr. Boas (9) made some comparisons of development, particularly in dentition and ossification of the skeleton, which showed a greater advancement on the part of girls at this period. As he has stated, however, the number of data was limited, and the study rather of a preliminary nature. While his conclusions are partially correct, it may still be said that no extended comparison of facts has been made to decide the matter of comparative advancement of the physical development in the sexes at the beginning school period of life. It is our purpose here to attempt such a comparison.

Height.—Comparison of absolute height at any given time in the early years does not show any cause for a differentiation of the sexes. The same is true of comparisons where added increments are reckoned as percentages of previously attained height. A question arises, however, as to whether this is an adequate method for getting at the actual attainment for a given age. At maturity the male is considerably larger than the female. Nor do they reach maturity at the same time. If, then, our final comparison is to be one of unequals, comparisons previous to that time should not be on a basis of absolute equality, else erroneous conclusions will result. What we should ask is not, " Does the height of the boy equal that of the girl at a given age?" Rather should the question be, " What are the percentages of final, adult height reached in the two cases at a given age? "

Comparison by such a method has been attempted. In a preliminary reckoning, taking Dr. Boas' averages for children of larger American cities, as given by Burk (17, Table H.), the average height of boys at 6.5 years is 69.88% of the average at 15.5 years, while of girls it is 70.35%.

Results thus computated, on the basis of data from a number of extended investigations, are given in Table D. Except in the last three cases, where the references are indicated, these are on the basis of the corrected averages given in Burk's " Table A " (17). These last three are not the corrected averages. Since adult heights could not be secured from the tables, the average at 17.5 years has been chosen as representing post-pubescent height.

Since girls are nearer adult height at the age of 17.5 years than boys of equal age, it is evident that they are at a disadvantage in these comparisons. Yet in every case the indication is that they have attained a greater percentage of their post-pubescent height at the age of 6.5 years than boys of the same age. Comparisons with averages of adult height would be more accurate, but it is plain that they would also show greater differences of the percentages, thus making the girls appear still more advanced, relatively.

TABLE D.

PERCENTAGE OF POST-PUBESCENT HEIGHT ATTAINED AT SCHOOL ENTRANCE PERIOD.

Investigator	Age	Compared to	Percentage for	
			Boys	Girls
Bowditch (Boston)	6.5 yrs.	17.5 yrs.	66.08	70.03
Porter (St. Louis)	“	“	66.	67.60
Peckham (Milwaukee)	“	“	66.10	69.60
(Oakland)	“	“	58.20	70.80
West (Worcester)	“	“	66.90	69.70
Gilbert (New Haven)	“	“	67.06	70.70
Gilbert (Iowa)	“	“	65.98	69.14
Key (Sweden)	“	“	69.40	70.60
Anth. Com'n (England)	“	“	66.46	68.60
Quetelet (Belgium)	“	“	65.60	66.66
Pagliani (Turin)	“	“	64.60	65.90
Hertel (Denmark)	“	16.5 yrs.	68.11	70.40
[1] Smedley (Chicago)	“	17.5 yrs.	66.99	70.29
[2] Lange (Germany)	“	“	60.38	69.31
[3] Bobbitt (Phil. Is.)	8	17	72.89	78.33

[1] See (84). [2] See (90, pp. 10-11). [3] See (12).

As a matter of interest, comparison of average heights of feeble-minded in nineteen institutions, as given by Goddard (35), was made, using ages six and twenty. Percentage of twenty-year height reached at the earlier age was, for males, 66.76, for females, 68.82.

Weight.—As in case of height, data for the average attainments of weight have not indicated any differences in the sexes preceding the pubescent period of growth. Both Porter (66) and Burk (17) noted a slight superiority of boys during the first few school years. Applying the method of comparisons just used in case of height, however, and using again the corrected averages from Burk's collection of data (17, Table E), we obtain the results presented in Table E.

While there is slight lack of uniformity in these results, in general it holds true that there is shown a superiority of girls in the amount of post-pubescent weight attained at the earlier age.

In case of both height and weight, therefore, the relative attainment of girls is shown to be slightly superior to that of boys at about the age of 6.5 years.

Skeletal Development.—Radiographic studies have shown that ossification of the skeleton proceeds more rapidly in girls than in boys during the early years. This is especially notice-

TABLE E.

Percentage of Post-pubescent Weight Attained at School Entrance Period.

Investigator	Age	Compared to	Percentage for	
			Boys	Girls
Bowditch.....(Boston).....	6.5 yrs.	17.5 yrs.	35.45	37.48
Porter........(St. Louis)....	"	"	35.58	35.94
..............(Oakland)....	"	"	36.14	38.99
Peckham.....(Milwaukee)..	"	"	34.35	38.04
West.........(Worcester)...	"	"	34.64	38.00
Gilbert.......(New Haven).	"	"	36.00	38.96
Gilbert.......(Iowa).......	"	"	32.82	34.38
Key..........(Sweden).....	7.5 yrs.	"	*39.60*	*39.53*
Hertel........(Denmark)...	6.5 yrs.	16.5 yrs.	*39.64*	*39.23*
Erismann.....(Moskow)....	"	"	34.83	42.37
Pagliani......(Turin).......	"	17.5 yrs.	31.66	34.57
Anth. Com'n..(England)....	"	"	33.91	36.10
Misawa.......(Japan)......	"	"	34.61	37.14

able in the carpal bones of the wrists and the epiphyses of the joints. Dr. Rotch makes this statement, but gives few data (80, p. 416). Pryor's studies, however, give data by which this seems to be clearly indicated (69), though their number is limited. He quotes a conclusion from a previous paper by himself as follows (69, p. 3): "The bones of the female ossify in advance of the male. This is measured first by days, then months, then years."

Choosing the trapesoid bone of the wrist as an example, we may note that he finds its time for ossification to be between the fourth and fifth year in the female, between the fifth and sixth year in the male (69).

Dentition.—Differences in the time of eruption of the teeth should again be emphasized at this point. Greater rapidity in the eruption of the teeth of girls was shown in case of each of the investigations referred to, beginning with the first molars and continuing up to the time of appearance of canines and second molars. The difference is by no means as great, however, at the first molar stage as Boas found (9, p. 815) from his limited collection of data. Röse's averages show the difference in time of first molars to be as small as one to two months. It should be emphasized again that the difference in eruption time of the teeth grows progressively greater with advancement of dentition. By the time the second molars appear, the difference in time between the two sexes approximates the difference in time between their attainment of pubescence.

Growth of the Brain.—The limited number of data renders comparisons of brain weights for the two sexes very difficult. Only general indications may be noted. Curves constructed on the basis of Vierordt's data (30, p. 105) seem to indicate an earlier attainment of adult brain weight in females. This can be said to be little more than an indication, however, on account of the difficulties of method formerly referred to and the great variability in brain weights.

Neuro-Muscular Development.—The probability indicated by brain weights is in correspondence with that indicated by facts of muscular control. Hancock found in his swaying tests that girls were more steady in the early years than boys (41). Automatograph tests showed better lateral control of the arm, and tremograph tests showed greater control of finger movements among girls also. Observations of less definite tests again showed the superiority of girls in control of movements.

Bryan's tapping tests seem to be alone in their showing of better control on the part of boys. He says (14, p. 173) that differences are slight, but that within the narrow limits indicated there is a slight superiority of boys over girls.

Strength tests were compared by Burk (17) by a method similar to the one we have used for height and weight. From the data of Porter, Roberts and Gilbert he found percentages indicating that boys had attained 1/5 their sixteen-year strength at the age of six years, 1/4 from six to eleven. Girls had gained a greater percentage at six, and from this on their acquirement was more rapid than that of boys.

Gesell noted that boys as a class show greater tendency toward uncoordinated writing as early as the first grade and up through the high school (33).

In this connection should be mentioned again that, beginning with the age of seven, the range within which pure tones can be sung is wider for girls than for boys.

Stuttering, which begins most often in the early years, has been found in a number of investigations to be more prevalent among boys (22, p. 361). Various ratios for the sexes have been reported. Conradi reports also that girls learn to talk earlier than boys (22, p. 363).

With the exception of the tapping tests, all the indications of power of control here enumerated show superiority in girls.

Summary.—On the basis of the data here presented it seems fair to conclude that the physical development of girls is relatively more advanced than that of boys at the age of five or six or thereabouts. On the average they have then attained a greater percentage of their post-pubescent height, a greater percentage of their post-pubescent weight, their skeletal development is more advanced, and their dentition has progressed further. Aside from this there is a strong suggestion that a greater percentage of adult brain weight has been attained by them, and this is supported by the fact that most data available show a more advanced power of neuromuscular control. How great the difference in general physical development is a matter to be determined by further investigation.

Discussion, Pedagogical Suggestions, and Summary

So far, the aim has been to find solutions for our two main problems. For the first we may say that, while not proved, a great mass of data indicate a transition in physical development at the period of usual school entrance. Regarding the second we may say that greater advancement in the physical development of girls at this time is pretty clearly shown.

The solution or partial solution of these two problems suggests a number of others. If this is a transitional period, what is its fundamental nature? Is the transition general or due to a single factor, as dentition? That it is the former seems to be the case, but it is still an open problem. In case the transition is not of a general, fundamental nature, then a whole series of problems regarding the relationship of these several transitional phenomena arise. For example, is rapidity of dentition to be correlated with rapidity of skeletal ossification, as Holt (45) has stated is the case in infancy? Are disturbances of growth in height and weight noted at this period due to conditions of dentition or do they occur regardless of it?

The correlation of mental with physical development at this period is a problem which those working with mental tests cannot afford to neglect. Granted a degree of physical and mental correlation, and that this period is a transitional one for physical development, then the whole question of qualification for school entrance is thrown open anew. The problem is still further complicated by the fact of great variability shown in the developmental factors at this time.

In view of their close relationship to other phases of physical development, and in the absence of definite methods of grading, the question arises as to whether the time of appearance of the first molars could not be cited as a point before which school duties should not be imposed.

The differences of the sexes at this period also suggest some important problems. Recalling that the female reaches maturity some three years earlier than the male—or nearly so —and that she reaches the pubescent stage almost two years earlier, on the average, the fact that she has progressed further at the school entrance age is to be expected. The question arises here, however, as to how early the differentiation of the sexes actually begins. Since differences in the averages of absolute measurements are noticeable at birth, and in view of the popular opinion that the prenatal period is shorter for females than for males, one is tempted to raise the question as to whether differentiation does not actually begin before birth.

The problem of the amount of difference between the sexes comes up, and also the further one of working out a method sufficiently refined to measure them. The question as to what this difference signifies for the pedagogy of this period of life is an extremely important one.

The preceding facts and conclusions form the basis for some further conclusions and suggestions for the hygiene and pedagogy of the early years of childhood.

We have shown that boys and girls of equal age are not equally advanced physically at the school entrance period of life. We have presented a mass of evidence in support of the conclusion that this is a transitional period in the physical development, referring to the great individual variability, as indicated by dentition, skeletal development, etc. Associating these facts with the indications of a correlation between mental and physical development, the need of a physiological grading for entrance to school becomes strikingly evident. Granted a proper grading for entrance on this basis, the grief and the expense of " repeaters " up through the grades would be tremendously lessened. School entrance should be on the basis of the fitness of the individual, not on the basis merely of his chronological age.

Again, the rapid growth, the ease with which the delicate balance of the organism may be overthrown, the lasting detrimental results following the wrong " inclination of the twig," all suggest that the thing of supreme importance in these early years is rather health and development than formal school work. The paramount importance of habits of health is shown over and over again in case of the teeth. Lack of the habit of cleanliness of the teeth is followed by caries, loss of bicuspids or all important first molars, with probably ill-fitting permanent dentures, deformed facial features and injury to health. Habits of thumb-sucking, mouth-breathing, and the like, may cause malocclusion and abnormal growth of jaws and related facial parts. Good permanent tooth crowns are largely dependent upon fresh air, exercise and good nourishment throughout the first five or six years of life. Attention to all these things should be first until after the organization of the childish body is more nearly complete.

The eyes are unfit for close visual work until after the transitional period.

Adenoids left uncared for in these early years are liable to cause disturbances of development. According to Yearsley (104) the time to have them removed is after six months and before six years of age.

Enlargements of the tonsils, with decreased power to resist invasions of micro-organisms, accompanies eruption of the first molars, in many cases (100, p. 13). Until after this time, no child should be confined to the school room where his chances of exposure to infectious disease germs are increased.

In view of all these things, this survey would be worth while, even though it did no other thing, could it portray in its true light the importance of all the years of earlier childhood for the normal, healthy physical development of the child.

From a different viewpoint another suggestion is in place. Could "types" be agreed upon for use in comparisons of stature, and like physical characteristics, similar to these used in anthropometry, much more accurate knowledge of development might be gained. Grouping of material according to types, combined with comparisons of relative advancement, such as we have used above, should lead to more satisfactory results in indicating stages of development.

Final Summary.

The main conclusions to which the facts presented in this thesis point are:

1. That there is a mass of evidence indicating a transition in the physical development of the child at the period of usual school entrance.

2. That there is evidence to show that girls are on the average more advanced in their physical development at this period.

3. That requirements for entrance to school based on stage of progress in physiological development, or physiological age, would be far superior to a requirement taking account of chronological age only.

4. That in the application of physical measurements for the purpose of finding degree of progress in physical development, a method indicating the percentage of adult size attained at a given age is superior to a method comparing absolute data directly.

5. That the hygiene and pedagogy of this period are of prime importance for the future development and welfare of the individual.

BIBLIOGRAPHY

1. ANGLE, EDWARD H. Treatment of Malocclusion of the Teeth. S. S. White Dental Mfg. Co., Phila., 1907. 628 p.
2. BAGINSKY, DR. ADOLF. Handbuch der Schulhygiene. (3, Aufl.) Enke, Stuttgart, 1900, 2 vols.
3. BAELZ, E. Anthropologie des Menchenrassen Ost-Asiens. Zeits. f. Ethnologie, 1901, vol. 33, pp. 202-220.
4. BAGLEY, W. C. Correlation of Mental and Motor Ability of School Children. Am. Jour. Psy., 1901, vol. 12, pp. 193-205.
5. BAKER, LAWRENCE W. A Preliminary Study of the Influence of Forces of Occlusion on the Development of the Bones of the Skull. Reprint from Items of Interest, Feb., 1911, vol. 33, No. 2, 13 p.
6. BARTH, DR. ERNST. Einführung in die Psychologie, Pathologie und Hygiene der menschlichen Stimme. Verlag von Georg Thieme, Leipzig, 1911. 507 p.
7. BELL, SANFORD. An Introductory Study of the Psychology of Foods. Ped Sem., 1904, vol. 11, pp. 51-90.
8. BERTEN, (Dr. Med., in Würzburg). Ueber Chronologische Reihenfolge des Durchbruches der bleibenden Zähne. Deutsche Monatschrift f. Zahnheilkunde, 1895, vol. 13, pp. 266-277.
9. BOAS, FRANZ. The Growth of Children. Science, Dec. 13, 1912, vol. 36, N. S., pp. 815-818.
10. —— ——. On the Growth of Toronto Children. Report of Comm'r. of Ed., 1896-7, pp. 1541-1599.
11. BOAS, F., and WISSLER, C. Statistics of Growth. Gov't. Printing Office, Washington, D. C., 1905, 132 p. (Report, Comm'r. of Ed., 1904. Chap. 2.)
12. BOBBITT, JOHN FRANKLIN. The Growth of Philippine Children. Ped. Sem., 1909, vol. 16, pp. 137-168.
13. BROWN, MAUGHAN H. Relationship Between Enlarged Tonsils and Carious Teeth. School Hygiene, 1913, vol. 4, pp. 24-25.
14. BRYAN, W. L. Development of Voluntary Motor Ability. Am. Jour. Psy., 1892, vol. 5, pp. 125-204.
15. BURGERSTEIN, L. und NETOLITZKY, A. Handbuch der Schulhygiene. Barth, Leipzig, 1912. 548 p.
16. BURK, FREDERICK. From Fundamental to Accessory in the Development of the Nervous System. Ped. Sem., 1898, vol. 6, pp. 5-64.
17. —— ——. Growth of Children in Height and Weight. Am. Jour. Psy., 1898, vol. 9, pp. 253-326. (Contains a very complete bibliography, consisting of 109 titles.)
18. BURNHAM, W. H. Hygiene of the Teeth. (With bibliog.) Ped. Sem., 1906, vol. 13, pp. 293-306.

19. Burt, Cyril and Moore, Robert C. Mental Differences between the sexes. Jour. of Exp. Ped., 1912. Vol. 1, pp. 273-285 and 355-392.

20. Chiles, R. P. X-ray and Anatomic Grading. World To-day, 1912, vol. 19, pp. 1419-1422.

21. Christopher, W. S. The Three Crises in Child Life. Child Study Monthly, 1897, vol. 3, pp. 324-335.

21½. Clouston, T. S. Neuroses of Development. Bliver & Boyd, London, 1891. 135 p.

22. Conradi, Edward. The Psychology and Pathology of Speech Development in the Child. Ped Sem., 1904, vol. 11, pp. 328-380.

23. Cornell, Walter Stewart. Health and Medical Inspection of School Children. F. H. Davis Co., Phila., 1912. 614 p.

24. Crampton, C. Ward. The Differences between Anatomic, Physiological and Chronological Age as Causes of Derailment. Proc. Nat. Assocn. for Study and Ed. of Exceptional Children. April, 1910, pp. 70-75.

25. —— ——. Influence of Physiological Age upon Scholarship. (Abstract of a paper read before the Nat. School Hygiene Assocn. of America, Washington, D. C., May 6-7, 1907.) Psy. Clinic, 1907, vol. 1, pp. 115-120.

26. —— ——. Physiological Age—A Fundamental Principle. Am. Physical Education Rev., 1908, vol. 13, Sec. 1, pp. 144-154; Sec. 2, pp. 214-227; Sec. 3, pp. 268-283; Sec. 4, pp. 345-358.

27. Cryer, M. H. Studies of the Internal Anatomy of the Face. S. S. White Dental Mfg. Co., Phila., 1901. 176 p.

28. Cunningham, D. J. Text-book of Anatomy. (3rd Ed.) Wm. Wood and Co., New York, 1909. 1427 p.

29. Daffner, F. Vergleichende Untersuchungen über die Entwickelung, der Körpergrösse und des Kopfumfanges. Archiv. f. Anthropologie, 1884, vol. 11, pp. 37-44.

30. Donaldson, Henry Herbert. The Growth of the Brain. Scribners, N. Y., 1895. 374 p.

31. Douglass, Robert K. Society in China. A. D. Innes & Co., London, 1895. 434 p.

32. Engelsperger, A. und Ziegler, O. Beiträge zur Kenntniss der physischen und psychischen Natur des sechsjahrigen, in die Schule eintretenden Kindes. (a) Experimentelle Pädagogik, 1905, vol. 1, pp. 173-235; (b) Experimentelle Pädagogik, 1906, vol. 2, pp. 49-95.

33. Gesell, Arnold L. Accuracy in Handwriting as Related to School Intelligence and Sex. Am. Jour. Psy., 1906, vol. 17, pp. 394-405.

34. Gilbert, J. Allen. (a) Experiments on the Musical Sensitiveness of School Children. Studies from Yale Psy. Lab., 1892-3, vol. 1, pp. 80-87. (b) Researches on Mental and Physical Development of School Children. Studies from Yale Psy. Lab., 1894, vol. 2, pp. 40-100. (c) Researches upon School Children and College Students. Uni. of Iowa Studies in Psy., vol. 1, pp. 1-39.

35. Goddard, Henry H. The Height and Weight of Feeble-Minded Children in American Institutions. Jour. of Nervous and Mental Diseases, 1912, vol. 39, pp. 217-235.

36. Grützner, P. von. Physiologie der Stimme und Sprache. (in) Hermann's Handbuch der Physiologie. Leipzig, 1897. (See Bd. 1, Theil 2.)

37. Gutzmann, H. Physiologie der Stimme und Sprache. (Bibliog. of 263 Titles.) Vieweg und Sohn, Braunschweig, 1909. 208 p.

38. Hall, Pres. G. S. Adolescence. Appletons, N. Y., 1907, 2 vols.

39. —— ——. The Contents of Children's Minds on Entering School. Ped Sem., 1901, vol. 1, pp. 139-173.

40. Halleck, R. P. The Bearings of the Laws of Cerebral Development and Modification on Child Study. Proc. N. E. A., 1897, pp. 833-841.

41. Hancock, John A. A Preliminary Study of Motor Ability. Ped Sem., 1894, vol. 3, pp. 9-29.

42. Hartmann, Berthold. Analyse des Kindlichen Gedankenskreises als die naturgemässe Grundlage des ersten Schulunterrichts. Graser, Annaberg, 1890. 115 p.

43. Hartwell, E. M. Report on Physical Training in the Boston Public Schools. School Document No. 8, 1894.

44. Heimann, Dr. Alfred, and Potpeschnigg, Dr. Karl. Ueber die Ossification der kindlichen Hand. Jahrbuch f. Kinderheilkunde, 1907, vol. 15, pp. 437-456.

45. Holt, Dr. L. Emmet. Diseases of Infancy and Childhood. Appletons, N. Y., 1899. 1117 p.

46. Hrdlica, Ales. Abnormalities of the Teeth and their Position. Jour. of Psych-Aesthenics, 1899, vol. 4, pp. 153-190.

47. Hueter, ——. Der Unterkiefer bei Neugeborenen und Erwachsenen. Virchow's Archiv (Zweite Folge), 1864, vol. 29, pp. 121 ff.

48. Humphry, G. M. On the Growth of the Jaws. Trans. Cambridge Phil. Society, 18-71, vol. 11, Pt. 1, pp. 1-5.

49. Jastrow, Joseph. The Dreams of the Blind. New Princeton Review, 1888, vol. 5, pp. 18-34.

50. Jessen, Dr. Ernst, and others. Die Zahnpflege in der Schule vom Standpunkt des Arztes, des Schulmannes, und des Verwaltungsbeamten. Beust, Strassburg, 1905. 67 p.

51. Johnson, George E. Condition of the Teeth of Children in Public Schools. Ped. Sem., 1901, vol. 8, pp. 45-58.

52. Köllicker, Albert. Die normale Resorption des Knochengewebes und ihre Bedeutung für die Entstehung der typischen Knochenformen. Vogel Lpz., 1873. 86 p.

53. —— ——. Entwicklungsgeschichte der Menschen und höhere Thiere. Englemann. Leipzig. 1897. 1033 p.

54. McCurdy, J. H. Adolescent Changes in Heart Rate and Blood Pressure. Am. Phys. Ed. Rev., 1910, vol. 15, pp. 421-432.

55. Merkel, Dr. Fr. Handbuch der topographischen Anatomie. Vieweg und Sohn, Braunschweig, 1885-90. 3 vols. (See Vol. 3.)

56. Monroe, Paul. A Text-Book in the History of Education. Macmillan, N. Y., 1906. 772 p.

57. Monroe, W. S. Tone Perception and Music Interest in Young Children. Ped Sem., 1903. pp. 144-146.

58. Meumann, Ernst. Vorlesungen zur Einführung in die experimentelle Pädagogik und ihre psychologischen Grundlagen. Englemann, Lpz., 1907. 2 vols.

59. Oppenheim, Nathan. The Development of the Child. Macmillan, N. Y., 1898. 296 p.

60. Papillault, G. Sur les modifications functionelles du squellette. Rev. Mens. éc Anthr., 1901, vol. 11, pp. 65-86.

61. Paulsen, Dr. Ed. Ueber die Singstimme der Kinder. Pflüger's Archiv f. die ges. Physiologie des Menschen und der Thiere, 1895, Heft 7 und 8, pp. 407-426.

62. Pedley, R. D. Care of the Teeth during School Life. (Pamphlet) by Med. Officers of Schools Assocn. Churchill, London, 1910. 15 p.

63. Pedley, R. D. and Harrison, Frank. Our Teeth: How Built Up, How Destroyed, How Preserved. Blackie & Son, London, 1908. 97 p.

64. Pfister, ——. Das Hirngewicht in Kindesalter. Archiv f. Kinderheilkunde, 1897, pp. 164-192.

65. Port, Gottlieb. Hygiene der Zähne und des Mundes. Moritz, Stuttgart, 1902. 94 p.

66. Porter, W. T. The Growth of St. Louis Children. Trans. Acad. Sci. of St. Louis, April 14, 1894, vol. 6, No. 12.

67. —— ——. Physical Basis of Precocity and Dullness. Trans. Acad. Sci. of St. Louis 1893, vol. 6, No. 7. 181 p.

68. Prinzing, Friererich. Handbuch der Medizinische Statistik. Fischer, Jena, 1906. 559 p.

69. Pryor, J. W. The Chronology and Order of Ossification of the Bones of the Human Carpus. Bulletin of the State University, Lexington, Ky., from the Laboratory of Anatomy and Physiology, April, 1908. New Series 1, No. 2, 24 p.

70. Quain. Elements of Anatomy. 10th Ed. Vol. 2, Pt. 1. Thane, Geo. D. Osteology—Arthrology. Longmans, Green & Co., London, 1904. 198 p.

71. —— ——. Elements of Anatomy. 11th Ed., 1908, vol. 3, Pt. 1. Schaefer, E. A. and Johnson, Symington. Neurology.

72. Quirsfeld, Dr. Ed. Untersuchungsergebnisse Physischer und geistiger Entwicklung bei 1014 Kinder vom 1. bis 8. Schuljahre. Trans. 2nd Internat. Congress on School Hygiene. London, 1907, pp. 214-216.

73. —— ——. Zur physischen und geistigen Entwicklung des Kindes während der ersten Schuljahre. Zeits. f. Schulgesundheitspflege, 1905, vol. 18, No. 3-4, pp. 127-185.

74. Riez, ——. Körperentwicklung und geistige Begabung. Zeits. f. Schulgesundheitspflege, 1906, vol. 19, No. 2, pp. 65-98.

75. Röse, C. Beiträge zur europäischen Rassenkunde. Archiv f. Rassen- und Gesellschaftsbiologie, 1905, vol. 2, pp. 689-798.

76. —— ——. Die Zahnpflege in der Schulen. Zeits. f. Schulgesundheitspflege, 1895, vol. 8, No. 2, pp. 65-87.

77. —— ——. Ueber die Mittlere Durchbruchzeit der bleibenden Zähne. Deutsche Monatschrift f. Zahnheilk., 1909, vol. 27, No. 8, pp. 553-570.

78. —— ——. Zahnverderbnis und Zensur. Deut. Monats. f. Zahnheilkunde, 1904, No. 6.

79. Rosenhaupt, Heinrich. Frühzeitige Zahnung. Archiv f. Kinderheilkunde. 1911, vol. 55, pp. 268-270.

80. Rotch, Thos. M. Roentgen Ray Methods Applied to the Grading of Early Life. Am. Phys. Ed. Rev., June, 1910, vol. 15, No. 6, pp. 396-420.

81. Rotch, Thos. M. and Smith, Harold W. A Study of the Development of the Epiphyses of the Hand and Wrist for the Purpose of Classifying the Cadets at Annapolis. Reprint from Trans. Assocn. Am. Physicians, 1910. 11 p.

82. Sayer, Ettie. Deterioration of Vision during School Life. Bericht ueber den l. Int. Kongress f. Schulhygiene, Nuremberg, 1903, vol. 3, pp. 515-525.

83. School Hygiene. Causation of Dental Caries. (A review from the Annual Reports for 1911.) School Hygiene, Feb., 1913, vol. 4, No. 1, pp. 61-62.

84. Smedley, Fred W. Chicago Pub. Schools. Dept. of Child Study and Pedagogic Investigation Reports. Nos. 2 and 3, Chicago, 1899-1901.

85. Smith, Priestly. On the Size of the Cornea in Relation to Age, Sex, Refraction and Primary Glaucoma. Brit. Med. Jour., 1889, vol. 2, pp. 1155 ff.

86. Stratz, C. H. (a) Der Körper des Kindes und seine Pflege, 3. Aufl. Enke, Stuttgart, 1904. 250 p. (b) Wachstum und Proportion des Menschens bevor und nach Geburt. Archiv f. Anthropol., N. S., vol. 8, pp. 287-297.

87. Thiele, ——. Versuch einer Biologie der Schulanfänger. Zeits. f. Schulgesundheitspflege, 1913, No. 6, vol. 26, pp. 377-386. (To be continued in later numbers.)

88. Tyler, John Mason. Growth and Education. Houghton, Mifflin & Co., Boston and N. Y., 1907. 294 p.

89. Variot, M. G. Nouvelle recherches radiographique sur l'ossification des metacarpiens et des phalanges chez les enfants amormaux et chez les hypotrophiques. Clinique Infantile, 1906, Reviewed in Jahrbuch f. Kinderheilk, 1907, vol. 15, pp. 781-782.

90. Vierordt, Hermann. Anatomische, Physiologische und Physikalische Daten und Tabellen. (3. neu bearbeitete Auflage) Fischer, Jena, 1906. 616 p.

91. —— ——. Das Massenwachstum der Körperorgane des Menschens. Archiv f. Anatomie, 1890, pp. 62-69.

92. Walkhoff, Prof. Dr. Der Einfluss der Vererbung und der Functionellen Selbstgestaltung bei der Entstehung von einigen Stellungsanomalien der Zähne. Deutsche Monats. f. Zahnheilks, 1910, vol. 28, pp. 865-873.

93. Wehmer, Dr. R. Enzyclopaedische Handbuch der Schulhygiene. Witwe und Sohn, Wieh und Leipzig, 1904. 1055 p.

94. Weld, Harry P. The Mechanism of the Voice and its Hygiene. Ped. Sem., 1910, vol. 17, pp. 143-159.

95. West, G. M. Observations of the Relation of Physical Development to Intellectual Ability. Science, N. S., 1896, vol. 4, pp. 156-9.

96. —— ——. Worcester School Children, the Growth of Body, Head and Face. Science, N. S., 1893, vol. 21, pp. 2-4.

97. —— ——. Growth of the Face. Science, N. S., 1891, vol. 18, pp. 10-11.

98. Witzel, Dr. Karl. Entwicklung der Kiefer und der Zähne beim Menschen. (75 Tafeln, mit Text in deutscher, französischer und englischer Sprache) Verlag d. Zentralstelle f. Zahnhygiene, Berlin, 1909.

99. Witzel, Dr. Julius. Die Zähne des Kindes. Vol. 1, pp. 323-337, in "Das Kind," von Selter und Rein. Enke, Stuttgart, 1911, 2 vols.

100. Wright, Geo. H. A Functional Relation of the Tonsil to the Teeth. Boston Med. and Surg. Jour., May 20, 1909, vol. 160, pp. 635-641.

101. —— ——. A Study of Maxillary Sutures. Reprint from Dental Cosmos, June, 1911. 10 p.

102. —— ——. I. A Group of Deformities of the Nasal Respiratory Tract, Coincident with Dental Irregularities. II. A New Instrument for Comparative Measurements, Demonstrating Changes in the Nasal Fossae when Readjusting the Maxillary Arch. (Reprint from) Dental Cosmos, March, 1912. 16 p.

103. Winch, W. H. When Should a Child Begin School? Ed. Psy. Monographs, Warwick and York, Baltimore, 1911. 96 p.
104. Yearsley, Macleod. The Causes Leading to Educational Deafness in Children. Reprint from The Lancet, July 20 and 27, 1912. 37 p.
105. Zielinsky, W. Ueber die Einstellung der bleibenden Molaren hinter dem Milchgebiss. Deutsche Monatschrift f. Zahnheilk, 1910, vol. 28, pp. 465-494.
106. Zsigmondi, Dr. Otto. Ueber die Veränderung des Zahnbogens bei der zweiten Dentition. Archiv f. Anatomie und Physiologie, 1890, pp. 367-390.

THE MENTAL PROCESSES AS AFFECTED BY ALCOHOL

By Karl J. Karlson

Science in itself is one thing; its application is another. Sometimes these two are confused; sometimes they coincide. Science should always be pursued for its own sake and truth be its own reward. When the results obtained happen to conform to a prevailing theory it is well. It is a grave question whether a man can be a true scientist who looks for practical results only; for by so doing he is apt to interpret wrongly the results which his experiments yield him. Especially is this true if public opinion is for or against a given result. His disposition may then easily make him look a little askant and interpret his results accordingly even if he means to be honest and truthful. Therefore, great care must be taken in all experimentation, not only in the procedure itself but also in interpreting the results.

The problem which this paper attempts to treat is primarily a social-economic one. The question may be asked: Does the consumption of alcohol enable us to do our work more efficiently? If so, let us use it and be more efficient. If it does not, let us give it up and thereby save ourselves a great outlay of money and energy. The attempt will be made to answer this question from a scientific point of view by showing what has been done in this line by apparently competent investigators. Although the subject is limited to the effect of alcohol upon the mental processes, the paper will not be confined strictly to this. Its effect upon muscular activity is also interesting and will be included. But even here we have to do with nervous energy expended in the coördination of the muscular movements.

One of the first experimenters in this field to use the ergograph was Lombard (8) of Clark University. He made so few experiments, however, that his results can not be considered conclusive. His doses were also very small. But in voluntary action he found a slight increase in the amount of work done. The effect showed itself in a few minutes after the dose was taken and lasted in one case for an hour and a half. He concluded that the apparently favorable effect of the alcohol was due to some central action.

Schumberg (18) made three experiments, one with and two without general fatigue. He also used a very small dose of alcohol, only 10 gr., and drew the conclusion that in uncomplicated ergographic work alcohol had a beneficial influence, but that, in the presence of general fatigue produced by work with the ergostat, it had no influence.

A very interesting series of experiments with the ergograph was made by Schnyder (17). He used the index finger of the right hand, one of the best trained muscles in the human body. The finger raised and lowered a weight until exhaustion, when there was a rest of one minute, and then the process was repeated again, and so on twelve times. Each pull was recorded by a line on a kymograph, the height of the line showing the strength of the pull. The length of the lines was measured and the work computed by the kilogrammeter, i. e., the strength it took to raise one kilogram one meter. Now if the supposition that alcohol is a food, is true, it ought to assist in raising the weight. In order to settle this question, he made several experiments both with and without alcohol, as well as with and without food. All experiments were performed four hours after the morning meal, at 12 M., under similar conditions.

Before the first set of experiments nothing was taken. This served as a standard of muscular efficiency.

Before the second set of experiments 30 gr. of tropon consisting of 90% of animal and vegetable proteids was taken.

Fifteen minutes before the third set of experiments 15 gr. of alcohol was taken in 150 ccm. of Bordeaux wine.

Before the fourth set of experiments, some food was taken, so as to show its effect upon the muscular capacity.

Before the fifth set of experiments, 30 gr. of alcohol was taken with some food, so as to show its effect when taken as in ordinary life.

The results shown in kilogrammeters are as follows:

Period.	1st set.	2nd set.	3rd set.	4th set.	5th set.	Loss in the last two sets:
1	8.089	8.656	8.473	7.969	7.376	
2	3.732	3.911	4.227	4.418	3.872	
3	3.102	3.447	3.288	3.656	3.373	
4	3.031	3.244	3.120	3.440	3.182	
5	2.904	3.115	2.992	3.245	3.016	
6	2.838	3.033	2.821	3.215	3.136	
7	2.863	2.938	2.816	3.248	3.996	
8	2.903	3.054	2.709	3.223	3.004	
9	2.875	3.108	2.674	3.233	3.076	
10	2.885	3.097	2.725	3.254	3.929	
11	2.939	3.106	2.745	3.322	3.993	
12	2.843	2.913	2.732	3.282	3.922	
	41.004	43.622	41.322	45.501	41.869	8.0%
First five periods	20.856	22.373	22.100	22.724	20.056	8.4%
Last seven periods	20.146	21.249	19.222	22.777	21.056	7.6%

From this we find that in the third set, with alcohol, there is not such a sudden dropping off as in the first two. The effect is somewhat similar to that in the fourth set, where food alone was taken. But this increase turns soon to a general decrease. The stimulating effect is soon lost and a paralysing effect takes its place. When the alcohol is taken with food, there is a detrimental effect from the beginning, which suggests that the body will not use alcohol as long as it has something else to absorb. Thus Schnyder concludes that alcohol affects the working capacity of every muscle in the body, but that it depends upon when and how it is taken as well as upon the quantities whether it shall have any really injurious effect or not. This conclusion seems rather erroneous, for it appears from the results to have an injurious effect when small quantities are taken too. He does not, however, lay any stress upon the time it takes for alcohol to show its real effects.

This point was clearly brought out by Hellsten (3), who made three sets of experiments with an ergograph which employed many more muscles than the one ordinarily used in these experiments. Each series consisted of five normal and five alcohol days, and the time devoted to each experiment was forty-five minutes. In the first series, in which he administered a very small dose of alcohol, the effect was so slight that it might have been due to chance variations. In the second series he made many more observations and gave doses of 80% alcohol thirty minutes before the work was begun. The effect of this is best shown by giving the total amount of work done during the normal and the alcohol days expressed in kilogrammeters. On the former this was 5,967 and on the latter 5,111, making a difference of .856 kilogrammeters.

In the third series of experiments, he used the same amount of alcohol as in the second but taken at different times—immediately, thirty minutes, one hour, and two hours, before the experiment was begun. In all the experiments alcohol diminished the power of productivity. When taken two hours before the experiment the decrease amounted to 11%, and when taken one hour before, the decrease was 17%. When taken immediately or shortly before the experiment, there was an initial increase, which came to an end the more quickly the larger the dose of alcohol was.

Thus Hellsten found a stimulating effect immediately after alcohol was taken, but after one hour a considerable loss in efficiency, depending of course upon the quantity of alcohol taken.

So far the taste of alcohol seems to have escaped any particular notice by most experimenters, and still the pungent flavor of alcohol as it is usually taken is particularly adapted to produce effects both mental and physical which may be reflected in the kind and amount of work done. The stimulating action may be very much enhanced by this flavor, which may produce an effect before the real effect of alcohol has had time to make itself felt. Rivers (14) attempted to ascertain what effect alcohol had when the taste was eliminated. For this reason a control solution was prepared which tasted as nearly as possible like alcohol. Then two mixtures of alcohol were made, one containing twice as much alcohol as the other, this merely to assist in the disguise. Four series of experiments were made upon the observer W, In each series there were three sets of six ergograms, each made with an interval between the sets of half an hour. The rhythm was two seconds and the interval between the ergograms two minutes. The weight was 4.5 kg. and the drug or the control solution was taken in the first series of experiments ten minutes before the beginning of the second set of ergograms; in the second, between the first and the second ergograms of the first set; in the third, a larger dose of 10-20 gr. of alcohol was used in the same fashion as before, except that the intervals on half of the days were to be occupied with multiplication and on the other half with typewriting. In the fourth series of experiments the dose was taken also between the first and second ergograms of the first set. The whole experiment lasted twenty days, on six of which no dose was taken, on five the control solution, and on the remaining nine days a dose of alcohol of either 20 or 40 gr.

The result of this very elaborate and painstaking study shows that in the first experiment there is a slight variation from the normal, but this variation is also found in the control mixture and Rivers concludes that it is due to chance. In the second experiment there is an increase in the amount of work done during the alcohol days, greater on those with a larger dose than on the other, but in this dose the control failed to work. This is at any rate suggestive. In the third experiment the small dose of 10 gr. had no particular effect while 20 gr. showed an increase in the ergograms of the second and third sets. In the fourth experiment there is a slight effect in the third set begun an hour and a half after the drug was taken. This effect is also constant, wherefore Rivers concludes that we may possibly have to do with real drug effect here. But with a small dose there seems to be no effect unless the observer knows he has taken alcohol.

In another series of experiments which Rivers undertook with larger doses of alcohol, 40 gr., there was a pronounced increase in the complete contractions and a smaller increase in the incomplete contractions. There was also great irregularity on different days; on some it was great, on others it was hardly noticeable. The immediate effect was slight, if any, but after it had once become noticeable it lasted fully three hours after the dose was taken. To determine therefore the duration of the effect an experiment was undertaken that covered a period of fifteen days with nine experiments a day. There was half an hour's interval between the first three experiments, while the intervals between the others lasted one hour. The curves show great irregularity, but the average increase in the amount of work done is very little. The increase was also immediate and lasted almost throughout the day.

We will now take up the experiments in which the mental processes are more directly involved. The pioneer work in Kraepelin's laboratory may well be illustrated in detail.

Aschaffenburg (1) was present at a meeting in Heidelberg where the assertion was made that even a small per cent of alcohol made work more difficult. He decided to test this assertion in the laboratory. Four typesetters offered themselves as observers. These were especially adapted for the purpose because their work could easily be measured both in quantity and quality. The external conditions were made as nearly as possible like the ordinary conditions under which they performed their work, and the experiments were made in their own rooms.

The observers were not total abstainers, but drank a glass of beer occasionally. During the experiment, however, they abstained from all liquor, as well as one day previous to the experiments. Their skill was as far as could be determined the same. The type was set from printed material, in order to eliminate manuscript reading, and a medium kind of type was used. The experiments were made on four consecutive days, Monday, Tuesday, Wednesday and Thursday, in the afternoon, and lasted for one hour and fifteen minutes. The first and the third days were normal and the second and fourth alcohol days. The only difference from their daily work was the sound of a bell every five minutes, when the letter should be placed on head. He supervised the experiments himslf, and the results were withheld from the observers until the experiments were completed.

The result of practice was also taken into consideration. It was found that there was a considerable increase in letters set every fifteen minutes as the experiments proceeded, varying of course in the different individuals. This led to a differentiation between what was expected and what was really done. The effect of fatigue was also taken into consideration. It would be unnatural to suppose that the increase on account of practice should in the long run counterbalance the effect of fatigue. The dropping off toward the close of the experiment on the normal days is therefore taken as a result of fatigue.

Each experiment was divided into five fifteen minute periods and the alcohol was taken on the second and fourth days, Tuesday and Thursday, after the first fifteen minutes' period. The amount taken was 200 gr. of good wine containing 18% of alcohol, thus not a very large amount. The results show that in the normal experiments the number of letters set in the second fifteen minutes was larger than expected, but afterwards the rôle changed and more was expected than was really done. In the alcohol experiments the work of the first fifteen minutes after the alcohol was taken was smaller than in the preceding fifteen minutes. On the first alcohol day the decrease is progressive; on the second it is greater than in the greatest fatigue of the normal experiment and reaches its maximum in the third period.

The following table will show the loss from fatigue and alcohol from what was expected on the various days as well as the increase by practice:

Observer	Monday Normal	Tuesday Alcohol	Wedn'sday Normal	Thursday Alcohol	Increase by Practice	Decrease byFatigue & Alcohol
Str.	2.1%	13.4%	5.8%	18.4%	8.2%	31.5%
L.	3.1%	7.4%	11.5%	16.3%	8.3%	30.0%
H.	8.2%	10.6%	6.4%	14.9%	4.6%	35.5%
K. O. G....	4.1%	14.2%	10.7%	18.9%	5.5%	42.4%

It is rather difficult to find the exact percentage of the effect of fatigue on the alcohol days, since we have to do here with the effect of alcohol too. But since Str. showed a decrease on the first day of 2.1%, and on the third day of 5.8% when no alcohol was taken, we may assume this percentage to hold throughout on the alcohol days too. If this be the case we should have twice 7.9%, or a total of 15.8%, to be deducted from the total of all four days, leaving in this case 15.7% decrease on account of alcohol. In this observer the effect of fatigue would thus be 0.1% greater than the effect of alcohol, but in all the other cases the effect of alcohol would be greater as is seen on the table. In all cases but one, L on Wednesday, the decrease is by far the greatest on the alcohol days. In the case of Str. the decrease on the first day is only 2.1%, but on the last, alcohol day, 18.4%. We have here undoubtedly to do with the lasting effect of alcohol, too, so that the effect of one day was not entirely gone before it was reinforced by the alcohol on the next alcohol day.

It may be worth while to give the results of the experiments in "ems" set, also; for that will show the effect of alcohol even more plainly:

Observers	Monday	Tuesday	Wednesday	Thursday	Losses Tuesday	& Thursday
Str.	2339	2212	2560	2353	9.7%	11.9%
L.	2405	2449	2487	2492	0.0%	1.4%
H.	2241	2265	2458	2314	3.6%	9.9%
K. O. G.....	1528	1449	1608	1495	7.6%	9.3%

As is seen in this table, there are five cases where the men set less "ems" on T. and Th. than on M. and W., although they had the advantage of practice, and in the other cases the increase is very slight. Although the losses vary, as might be expected, in the different individuals, there is loss nevertheless from the previous day in all cases except three, L. on T. and Th. and H. on T., and sometimes very heavy. The increase from practice does not counterbalance this effect, and this increase is considerable. If we, for instance, take the increase of Str. from M. to W. as an increase in ability, we have 221 "ems" to be attributed to that, which would make 110 "ems" per day. In this case he should have set 2449 "ems" on T. and 2670 on Th., but instead he set only 2212 and 2353 on those days respectively, a very considerable loss.

The fact that the losses are heavier on Th. than on T. seems to show that the effect of the previous alcohol day has not yet disappeared when the new effect begins. The same was seen in the former table.

Aschaffenburg did not find that the quantity of alcohol he gave his observers had any effect upon the quality of the work done. No more mistakes were made in the alcohol experiments than in the normal, but he found that more mistakes were made on Monday than on any other day owing, as he assumed, to the falling off in practice during Sunday.

Thus he concludes that certain quantities of alcohol, 36-40 gr., decrease the productivity. Only once in eight experiments was this decrease absent. It averages 15.2% of the product which could have been expected without fatigue and without loss of practice. But the fatigue alone showed an average loss of 6.5% of the expected product. This leaves 8.7% to the credit of alcohol.

Kürz and Kraepelin (7) wished to find out what effect the quantity of alcohol contained in two liter beer, usually 80 gr., had upon the mental ability if taken regularly day by day. Hence they started an experiment which lasted twenty-seven days. No alcohol was taken during the first five days, but in the evening of the fifth and on the following twelve this dose was taken just before going to bed. On the twenty-third and twenty-fourth days the same amount was taken as before. Unfortunately they did not have very many observers and were consequently not able to compare the results to any great extent. The experiment was performed at nine o'clock in the morning and lasted for two hours. The first half hour was devoted to adding single place numbers, the next half hour to memorizing twelve place numbers. In both these experiments the results were registered every five minutes. Then two periods of five minutes each were taken during which free associations to a given word were written down. And finally 308 monosyllabic words and 381 nonsense syllables were read off from a revolving drum. Thus the experiment took in: 1, Ability to comprehend; 2, Habitual association; 3, Free association; and 4, Ability to notice.

It was of importance to know the condition of the observer when not under the influence of alcohol, hence the first period; then to know the permanence of the changes called forth by alcohol, if any, and what effect a new beginning of alcohol had, after a time without it. The results were as follows:

1. In the experiment in adding there was a steady increase during the first eight days, three of which were alcohol days, but after the eighth day there was a small decrease, and on the fourteenth and sixteenth there was a good increase, which was followed by a decrease again, so that the result was not better on the eighteenth day than on the fifth, although the observer had had the benefit of practice all the time. Consequently the practice of thirteen days was lost.

2. The effect of the twelve alcohol days was not completely overcome for five non-alcohol days, although the work done on these was greater and more regular than on the preceding alcohol days.

3. After a longer period of alcohol, a keen sensitivity to the same remained, even after a period of abstinence of five days, which is seen in the rapidly sinking curve when alcohol is resumed for two days, the twenty-third and twenty-fourth.

In the experiment on the learning process Kürz and Kraepelin found that approximately the same changes took place as in adding, except that the irregularity and the falling off in the product was somewhat greater. In addition the estimated loss was 25% while in memorizing it was 40%.

In the association experiment the number of associations made was continually decreasing until about 31% were lost.

The quality of the associations was not perceptibly influenced. Sensory images were not, however, so prominent.

In reading from the revolving drum the number of words and syllables omitted grew larger as the alcohol days went on, but the qualitative changes were not here either very great. The increase of fatigue was also very marked in all the experiments, but especially in reading.

Thus we find: 1, Slower addition. 2, A decrease in the ability to memorize and a conscious struggle between slowness and speed. 3, More difficult association. 4, More difficult comprehension.

It is to be regretted that these investigators did not have a larger amount of observers. To draw conclusions from one or two is dangerous. They might have reached the limit of their ability on the fourteenth day; for the curve never again reaches the same height until the very last day, which may very well be the result of an end spurt so often seen in experiments. Or perhaps the fluctuation may be due to the wave-like appearance of the learning process. The person who served as a control performed the work under normal conditions, and his curve shows a steady rise almost similar to the alcohol curve during the first eight days, after which it keeps on rising, while the alcohol curve declines.

Kraepelin made another experiment, in which he was one of the observers, on the influence of alcohol and other drugs upon the mental processes in reading, adding, and memorizing numbers. The reading was done in a low but distinct tone; and each five minutes the amount read was marked off and used as a standard. In adding, single place numbers were added as fast as possible; but only one number was shown to the observer at a time. When 100 was reached the 100 was dropped and what was left added until another 100 was reached, etc. Every five minutes at the stroke of a metronome the amount added was marked off with a pencil and used in computing the results. In memorizing, the Ebbinghaus method was followed and twelve-place numbers used. Each group was repeated until the observer could repeat it without mistake. When the observer made a mistake the whole group was repeated again. Each repetition was marked off with a horizontal line in the margin, and each five minutes with a vertical line.

The experiments were performed between 8-9 o'clock in the evening. The amount of alcohol taken was 30 gr. in some, and 20 gr. in other experiments. Each experiment lasted fifteen minutes with five minute intervals. A series of normal experiments was made to serve as a standard. There were in all seven observers. The normal experiment was performed before Christmas, the first alcohol experiment the seventh of March with 30 gr. and the other alcohol experiment the tenth of December with 20 gr.

In adding Kraepelin found that in the first fifteen minutes after the alcohol was taken there was a decrease in the numbers added in each five minute period. The great personal difference is very striking. One of the observers could add twice as many numbers as another. It is moreover clear that lack of practice for the long interval between the experiments made the standard worth very little. The influence of larger and smaller doses is very different in different individuals. A smaller dose had a greater effect upon one of the observers than a larger, but in general the larger dose showed its effect sooner, was greater, and lasted longer.

Kraepelin reports a subjective feeling of ease in these experiments and this is corroborated by other observers. He came to the conclusion that the different degrees of sensitivity manifest in different persons play a great rôle in the effect of alcohol. Sensitive persons suffer more immediate difficulty from a relatively small dose than do more stable persons, in whom the same dose and even a larger may give an initial increase before the falling off begins. If we compare the mean variation we find that the fluctuation is very great; and it is greater in persons who learn faster than in those who learn slower.

The repetitions necessary for learning the numbers varied considerably in the different individuals, from 17 to 68, and in all but two an increase of 5.4% in the repetitions was necessary during the course of the experiments. The larger dose does not seem to have had a very much greater effect upon the learning process. He. with 20 gr. needed 17 repetitions in the first experiment and 33 in the eight, while with 30 gr. 28 repetitions were necessary in the first and 32 in the eighth experiment. K. needed in the first experiment with 20 gr. 43 repetitions and with 30 gr. 47 repetitions, while in the eight with 20 gr. he needed 47, and with 30 gr. 53 repetitions. Thus with a dose 33% larger the increase in repetitions was only 2%.

In reading Kraepelin found a constant decrease of syllables read during the experiment under the influence of 30 gr. of alcohol, except in two cases where there was an increase, in one case from 2166-120 to 2423-38 and in the other from 2335-34 to 2498-19. In all but one case there was an increase at the beginning of the alcohol experiments over the normal. In three cases there was a decrease of syllables read even in the normal experiment, in one case from 2296 to 2037, in the second from 2231 to 2059, and in the third from 2182 to 2141. Thus in four normal and three alcohol experiments there was an increase in syllables read, while in three normal and five alcohol experiments there was a decrease.

Kraepelin concludes that alcohol makes the work more irregular and that the effect is greatest about half an hour after the dose is taken. This effect may, however, be counterbalanced and covered over by the influence of practice. The greater this is, the less influence has alcohol. This is seen most plainly in reading, but is noticeable also in addition especially during the first fifteen minutes. The initial uplift in memorizing and reading had no influence upon the mean variation.

The after-effect of alcohol upon the nervous system was found to be considerable both by Kürz, Kraepelin, Fürer, and Rüdin. Fürer tested himself in a series of experiments with 80 gr. of alcohol, taken in one case at night and in another at noon, in adding, memorizing numbers, and association. He found that not only in the evening after taking alcohol was there a considerable decrease in the results obtained but also the next morning. Rüdin (15) found that this after-effect will last for twenty-four hours and therefore influence any experiment made before the expiration of this time as well as reinforce the alcohol taken before this time has elapsed. In this way, he says, is the chronic effect of alcohol brought about. Its effects are cumulative.

In his experiment on the duration of the effect of alcohol upon the mental processes, Rüdin had three observers for eight days, and one for eleven. The first three were experimented upon for one hour and ten minutes, morning, afternoon, and evening in the following way: 9:10-20 association, 5 minutes pause; 9:25-55 addition, 5 minutes pause; 10:00-30 memorizing. In the afternoon the experiment began at 2:30 and in the evening at 9 and proceeded in the same way as in the morning.

The fourth observer reacted also to complex stimuli so that his experiment lasted a little longer.

The quantity of alcohol taken corresponded to one-half liter of Greek wine with 18 to 20% alcohol, or two and one-half liters of beer, in all about 90 to 100 gr. of alcohol. It was taken half an hour before the experiment began, but in one observer only on the eighth day.

Rüdin found that alcohol had a detrimental effect both upon adding and committing to memory. Only in one observer was this effect not so marked. When the experiment was repeated, the loss was twice as great as in the first. In one observer alcohol increased the repetitions necessary for retention but decreased the number in committing to memory. In another it seemed to have the same effect upon both processes. In two observers it decreased the number of repetitions but left their value in learning unchanged. The vocal movements were more difficult in two of the observers who happened to be motor minded but accelerated in the other two who were more sensory minded. The duration of the choice reactions was very much shortened immediately after taking the alcohol in two of the experiments. In one it was lengthened perhaps because in the beginning of the experiment the sensory part of the reaction was still noticeable and injury to it must necessarily lead to an increase in the time taken for the choice; but on the other hand under the influence of alcohol upon the motor discharge, especially short reactions took place. In two experiments there was a decrease perhaps because there was a gradual change of the reactions into motor, taking place toward the end of the experiment, and the disturbing effect of alcohol had less influence upon the comprehension of number than upon the acceleration of movement. Corresponding to the shortening of the time in choice reactions the numbers of errors increased from 1-2% in the normal to 4% after the first and 5% after the second dose of alcohol. The numbers of associations decreased in two observers but increased in two. This contradiction is apparently due to the different types which the individuals belong to, because alcohol seems to favor motor minded persons more than anybody else.

The after-effect lasted in two observers for forty-eight hours but was wholly lacking in adding and memorizing in one observer. The fourth showed some after-effect after twelve hours in adding but none in memorizing and association. Otherwise disturbances were seen all the way from twelve to forty-eight hours depending upon the kind and complexity of the work.

In another experiment on three students Rüdin (16) attempted to find out what effect alcohol had upon the ability to comprehend and upon the ability to retain. The observers read from a revolving drum which exposed, one at a time, 308 monosyllabic words and 331 nonsense syllables. The experiment was performed four times a day at 8, 12, 4, 8 o'clock for five days. On the third day a dose of 100 gr. alcohol was given the observer two minutes before the experiment began. It took seven minutes for the drum to revolve and a pause of ten minutes, sometimes twelve, was taken between the experiments. Immediately afterwards thirty cards with nine letters on each were exposed for 16.7 seconds. Ten of these cards were to be reproduced immediately from memory, ten after 15 seconds, and the last ten after 30 seconds.

Rüdin found a marked disturbance in all observers, but the result due to practice was plain throughout. Comprehension suffered a gradual decrease until it reached the minimum at about eight hours after the dose was taken. The onset was from six to nineteen minutes after the dose was taken. The reading of nonsense syllables was more disturbed than the reading of words. The reading of cards was little affected in the first series, but in the second there was quite a disturbance, which became even more marked in the third series. The influence of alcohol was stronger and lasted longer in a more difficult task than in one less so.

The difference between the individuals as to the onset and disappearance of the effect of the alcohol was very marked. In one case it came on slowly and lasted long, and in another it came on suddenly and disappeared rather suddenly. In one observer it affected one kind of work more noticeably, in another another kind of work.

Mayer (9) undertook to find out what influence alcohol had upon writing. He served as an observer himself. Kraepelin and Rüdin had found that comprehension and sense impressions were made more difficult and that the acts of will were not made more easy. The ergograph experiments had shown that the energy used up under the influence of alcohol was not very much greater after all. It was to find out and solve, if possible, this seeming inconsistency that Mayer undertook his experiments. The first of these lasted for seven days, four of which were alcohol days and three normal; the second included two alcohol days and one normal. In the first experiment 30 gr. of alcohol were used and in the second 60 gr. The problem was to write as fast as possible the numbers 12345678910 twice, and then 01987654321 once, the letters *inm,* with no dot on the i, and, finally, to draw a line ten cm. long between two points. These thirty-four signs were repeated every day, at first after five minutes intervals, then always after fifteen minutes. On the alcohol days the dose was taken after the first experiment was made. On the normal days the experiment lasted in the first series fifty minutes and on the alcohol days one hour and fifty minutes. In the second series the experiment lasted one hour and thirty-five minutes. They all began at eight o'clock in the morning.

The time it took to perform the different parts as well as the whole experiment was taken down in one hundredths of a second. The length the pen had to travel upon the paper was also measured, and the time it took to write each mm. was figured out. An account was taken of the pauses between the experiments and the pressure the hand exerted upon the pen.

Mayer compared his results with those of similar experiments made by Diehl and found that his results were as a rule more regular and reliable. This he attributes to education, Diehl's observers being uneducated.

In his own experiments Mayer found that the "Schreibweg" was not very much influenced by alcohol, but that the mm-time, the measure of speed, was decidedly prolonged in the alcohol experiments. This is also shown in the time it took to perform the different parts of the experiments. The movements made in writing were not accelerated but decidedly slower especially after the larger doses. The effect began to show itself about five minutes after the alcohol had been taken and lasted during the whole experiment. It was least in the easiest problem, the writing of mm. The pauses between the single parts were decreased by the smaller doses and increased by the larger, but this was not very marked. The pressure exerted was apparently independent of alcohol. It increased at the beginning of the experiment and after small doses of alcohol; later it decreased, as it did also after larger doses.

Thus he found that alcohol makes the movements in writing slower, shortens the pause, and lowers the pressure in small doses; increases the pause and raises the pressure in larger doses; and that the fluctuation of pressure in written signs are shorter and lower.

Experiments on mental fatigue performed by Rivers simultaneously with his experiments on physical fatigue show that the numbers of multiplications performed in each period increase in the periods of the first half of the experiment while they decrease in the second half; this suggests an injurious effect of alcohol. The increase due to practice shown in the fourth experiment is much less than that in the second; this again suggests an injurious effect upon the work. The tests made on typewriting show the same thing. There is, to be sure, some increase in the amount of work done; but this is very little and irregular and accompanied by an increase both in corrected and uncorrected errors, especially in the former.

To test the influence of alcohol upon attention, McDougall (10) displayed a series of dots on a revolving drum, one by one, and asked his observers to mark them as accurately as they could. The slit in which the dots were shown was only fifteen mm. wide, and the drum revolved so fast as to require a maximum of attention. The series repeated day by day gave closely parallel results, but the errors made varied considerably at different hours of the same day. The series was then repeated with doses of tea and alcohol. The result of the whole experiment given in errors was as follows:

	Normal.	Alcohol.	Tea.
First series (four papers)....	374	583	273
Second series (three papers)...	298	351	291

The observers were aware that both alcohol and tea were given them, and McDougall says it would have been much better if this source of error could have been overcome, since he obtained negative results with only 15 gr. of alcohol but positive with larger doses. The numbers of errors, as is seen, is much larger on the alcohol day than on the normal; this shows that alcohol impaired the power of attention to a considerable degree.

Specht (19) attempted to find out whether the limina of discrimination and stimulation are changed under the influence of alcohol or not. As material he used primarily sounds. He found that these limina were affected in opposite directions: The discrimination limen was raised and the stimulus limen lowered; but the degree of the change was dependent upon the doses of alcohol taken. The difference was only quantitative, but false judgments are more frequent under the influence of alcohol.

The feeling of activity or exertion, prominent in the normal experiment, subsided, and the observers became more passive with consciousness narrowed down to the expected sensation. Other sensations which would disturb the sound sensations were excluded and the observers reported that they heard nothing of the noise made by the apparatus in the room.

Busch (2) undertook an investigation on the effect of alcohol upon the "clearness and extent of the optical consciousness." Kraepelin, Specht, and others had found a decrease in the mental activity, but it might be objected that, when letters or syllables are used as stimulus objects in the tachistoscopical experiments, the attention is possibly not changed but only the ability to associate and assimilate the partly seen elements limited or enlarged. There is also a possibility that one image may be transformed into another, i. e., auditory into visual, and so escape the possible check that may be brought to bear upon a certain kind of image, especially if this kind of image is less developed in the observer. For the most part, only the clearest part of consciousness has been taken into consideration. The other parts have been left unconsidered, and in connection with them Busch undertook his work. For this reason he gave his observers a complex picture, larger than their clearest point of vision could comprehend at one time. The observers were asked to look at one point steadily and then try to comprehend what was not in the direct vision. The new stimulus fell thus on parts of indirect vision which possess different degrees of clearness. In this way it was possible to measure the clearness of these parts and the regularity with which the different parts of the picture were comprehended or present in consciousness. The physical differences of the retina must, of course, be taken into consideration in this kind of experiment. In order to do this the complex figure was so changed that every part of the same was given an equal setting, but always so that the fixation point remained the same.

The dose of alcohol taken was 30 ccm, which in most persons would show some effect but cause no bad after effect. One hundred cards on which were written either numbers or letters were exposed to the observer for 17 seconds and he was asked to reproduce from memory what he saw.

Busch, who was most interested in the psychic effect of alcohol found a decided decrease in the tachistoscopic perception of simple visual stimuli. The degree of conscious clearness of the whole visual field he found to be lower on alcohol days than on normal. And yet there appeared in unbroken clearness one district of relatively more perfect perception than another, the limits between the two having approximately the same course as before. But the observation was no longer equally distributed over these fields. There was a tendency to turn away from the more obscure zones and to narrow down the field of consciousness.

More remote illusory phenomena often of a visual nature point to a relation between alcohol and the pathology of the visual organs and the visual disturbances in delirium tremens. These phenomena were especially striking during the first days and were followed more and more by an increasing sleepiness. The subjective effect appeared thereby somewhat later, but lasted, on the other hand, much longer.

The inference, Busch thinks, may be near at hand that the same holds true for the auditory perception, although he has not entered into this field with his investigation.

Busch feels justified in concluding that alcohol in smaller and medium doses disturbs the psychic functions and arouses the activity of the sensory and motor systems. Kraepelin found that alcohol influenced the motor field of activity at first increasingly and later decreasingly. Busch's investigation confirmed also the peculiar contradictions in the effect of alcohol. "A decrease of the optical consciousness in clearness and extent stands against an increase in physical and sensory activity. And this contradiction seems to be true in a larger measure for both psychic and physical functions. Perhaps it has not yet been pointed out in all physical activities that may come into consideration. Some mental fields are not yet investigated, and a further investigation of the visual sense with thorough methods, as a test of our results, would be welcome." One psychic activity may influence another. The pure feeling processes seem to be more affected than any other. An investigation of these would therefore be of great interest. The observers seemed never to become accustomed to the dose.

Hildebrandt (4) in his experiment on the effect of alcohol upon voluntary action, performed under the inspiration of Narziss Ach, found rather interesting results. He used the Müller and Schuman method of letters and nonsense syllables and divided his experiment into three parts. The observer was directed as follows: 1, Pronounce the first syllable that comes into consciousness after the stimulus. 2, Transpose the consonants at the beginning and the end of the syllable, but do not read from right to left. 3, Think of all the words that rhyme with the syllable. The syllables were presented on a revolving drum. After each sitting the observer was asked to tell what he had experienced—to introspect upon the mental processes employed in the experiment.

Since in this paper we are not interested in the mental processes *per se* but in the effect of alcohol upon them, we shall immediately turn to the results of the investigation.

The possibility of determination, the volitional power itself, is apparently not influenced by alcohol, but those factors which cause the concentration of the volitional power. This effect may, as a rule, be counterbalanced in doses of 50 ccm. alcohol by the consciousness of the changed condition in which the observer knows he is, so that the alcohol does not even diminish the objective results; these on the contrary are often increased with the customary quantities of alcohol taken, since the consciousness of the changed condition causes a stronger concentration of the volitional power.

That alcohol has a detrimental effect upon perception is a notion which has gained widespread acceptance, especially since Krapelin's and Ach's investigations. Hildebrandt found that this may be true but not to such an extent as was supposed.

The well established, mechanical associations are not affected by alcohol, at least not to any great extent. But if the association is not strong a disturbance occurs. This was more clearly noticed in the experiments with 100 ccm. alcohol. In 42 experiments with 50 ccm. the established association failed only once, while it failed four times in the normal experiment.

False reactions were seen both in the alcoholic and normal experiments and in all probability depended upon a weakened volitional tension. But they are sometimes the result of motor excitement, which was present both in the alcohol and normal experiments. This as a rule is not favorable to the right solution of a problem.

It was also noticed that the strength of the determination alone determined the degree of the volitional effect, and that the power to react in the right way, i.e., the ability to determine conditionally the course of the event, the volitional power itself, was in no way affected by alcohol.

This is quite contrary to the results of former investigations. Kraepelin, Kürz, Rüdin and others had found that perception was generally impaired by alcohol and that a change appeared in the motor and sensory irritability in conformity to the quantity of the dose taken. In Hildebrandt's experiments with 50 ccm. alcohol this effect upon perception was counterbalanced by a greater concentration of the volitional power brought about by the consciousness of the changed condition. In the experiments with 100 ccm, perception was, however, poorer but never so poor that voluntary action was impossible. Rüdin found, as Kraepelin had done before, that the time it took to make a choice reaction was decreased by alcohol and the number of false reactions increased. From this he inferred that alcohol caused a decrease in the volitional ability. But the question of the influence of alcohol upon the will is not so easily solved. In order to make the volitional acts approachable in their most energetic forms in observation, it is necessary to counterbalance the factors which oppose them. This Hildebrandt sought to do by employing the associative reproductive tendencies. Kraepelin and Rüdin were satisfied with reaction experiments in which no special volitional tension was necessary. A decrease in time and an increase in false reactions noticed by them belong particularly to the motor mode of reactions and not to annulments of volitional power.

In Hildebrandt's investigation the object was to study the short intermittent volitional acts during the experiment, between which the observers had time to rest. A new decision to perform the experiment in a right way could be made before the next experiment began, and this enabled them to do the prescribed task. The possibility of concentrating the volitional power upon a decision was never affected by alcohol.

Hildebrandt points out that this is paralleled in daily life where a person may suddenly be confronted with a difficult or serious problem whose solution under normal conditions requires some concentration, but the individual shows no trace of previous stress and acts rightly, i.e., he makes a new volitional decision.

With 50 ccm. the motor excitement played a subordinate rôle and was also noticed in the normal experiments.

Moll (11, 12) criticizes Kraepelin's experiments maintaining that he wished to prove that even small doses of alcohol are injurious to the nervous system and that he does not support this with sufficiently convincing laboratory experiments. The lack of proof Moll sees primarily in the fact that Kraepelin does not seem to have excluded suggestion and that the new conditions introduced by the experimental arrangements would in part at least cause a change in the results.

To this both Kraepelin and Isserlin (3) reply that it was not the primary object of the experiments to establish the injurious effect of small doses of alcohol. Kraepelin supports total abstinence on ethical and sociological grounds. They maintain that Kraepelin had taken precautions that his observers should not know the outcome of the experiments while these were still going on, and think that he thereby had precluded any idea of suggestion, because the experiments might come out quite different than they expected. Moreover the observers all along the line have reported a feeling of having done more in the alcohol experiments than in the normal. Moll's point is, however, well taken as far as it goes. Suggestion may, to be sure, play a great rôle and very easily comes in. Rivers tried to exclude the suggestive factor by using a control mixture. In some cases he was successful, but when the dose was a little strong the observers grew suspicious and recognized the effect where they otherwise might not have done so. As we saw in Rivers' experiments, there was a change in the curve when this recognition was made, so there really seems to be some connection between recognition and effect.

Thus we see that more experimentation is needed before we can come to any definite conclusion. At the present time there seem to be many contradictory results; and the individual differences are great; but it can surely be concluded that alcohol impairs every human faculty more or less. This effect is more pronounced in the higher faculties and, of course, with larger quantities of alcohol. It still remains to be shown that small quantities have a decided detrimental effect upon all kinds of mental activities.

The detrimental effect seems to be shown more in the quality than in the quantity of the work done.

The real effect of alcohol does not appear until some time after the dose is taken, but may last as long as forty-eight hours. A new dose taken during this time reinforces the effect still left of the other. For this reason the effect is cumulative, and chronic alcoholism may be the result.

The effect is different in different individuals; sensory and motor types are most affected.

The question asked in the first part of this paper must necessarily be answered in the negative. Alcohol does not make us more efficient, even if it can not be shown that small quantities impair the human faculties and destroy the human system. If taken in larger quantities, all experiments agree in showing a detrimental effect. In general, while it seems to stimulate the sensitivity, the higher mental powers are depressed.

Bibliography

1. Aschaffenburg, G. Practische Arbeit unter Alkoholwirkung. Psy. Arbeiten, 1896, vol. 1, pp. 608-626.
2. Busch, A. Über den Einfluss des Alkohols auf Klarheit und Umfang des optischen Bewusstseins. Jour. für Psychologie und Neurologie, 1910, 1911, vol. 17, pp. 63-82, 89-109, 1911, vol. 18, pp. 36-71.
3. Hellsten, A. F. Ueber den Einfluss von Alkohol, Zucker, und Thee auf die Leistungsfähigkeiten des Muskels. Skand. Arch. f. Phys., 1904, vol. 16, pp. 139-221.
4. Hildebrandt, H. Über die Beeinflussung der Willenskraft durch den Alkohol. Untersuchungen zur Psychologie und Philosophie, 1910, vol. 1, pp. 1-91.
5. Isserlin, M. Kraepelins Experimente mit kleinen Alkoholdosen. Zeit. f. die ges. Neur. und Psy., 1911, vol. 6, pp. 589-604.
6. Kraepelin, E. Ueber die Beeinflussung einfacher psychische Vorgänge durch einige Arzneimittel. Jena, Fischer, 1892, 258 p.
7. Kürz & Kraepelin. Ueber die Beeinflussung psychischer Vorgänge durch regelmässige Alkoholgenuss. Psy. Arbeiten, 1901, vol. 3, pp. 417-457.
8. Lombard, W. P. Some of the Influences which Affect the Power of Voluntary Muscular Contractions. Jour. of Phys., 1893, vol. 13, pp. 1-57.
9. Mayer, M. Ueber die Beeinflussung der Schrift durch den Alkohol. Psy. Arbeiten, 1901, vol. 3, pp. 535-586.
10. McDougall, W. On a new Method for the Study of Concurrent Mental Operations and of Mental Fatigue. Jour. of Psy., 1905, vol. 1, pp. 435-445.
11. Moll, A. Kraepelins Experimente mit kleinen Alkoholdosen. Zeit. f. Psychother. und med. Psy., 1911, vol. 3, pp. 65-86.

12. Moll, A. Nochmals Kraepelins Experimente mit kleinen Alkoholdosen. Zeit. f. Psychother. u. med. Psy., 1911, vol. 3, pp. 257-263.
13. Rivers and Weber. The influence of small Doses of Alcohol on the Capacity of Muscular Work. Brit. Jour. of Psy., 1909, vol. 2, pp. 261-280.
14. Rivers, W. H. R. The Influence of Alcohol and other Drugs on Fatigue. London, Arnold, 1908. 136 p.
15. Rüdin, E. Ueber die Dauer der psychischen Alkoholwirkung. Psy. Arbeiten, 1904, vol. 4, pp. 1-44.
16. —— ——. Auffassung und Merkfähigkeit unter Alkoholwirkung. Psy. Arbeiten, 1904, vol. 4, pp. 495-522.
17. Schnyder, L. Alkohol und Muskelkraft. Arch. für die ges. Phys., 1903, vol. 93, pp. 451-484.
18. Schumberg, N. Ueber die Bedeutung von Kola, Kaffee, Thee, Mate, und Alkohol für die Leistung der Muskeln. Arch. für Phys., 1899, Suppl. vol., pp. 289-313.
19. Specht, W. Die Beeinflussung der Sinnesfunktionen durch geringe Alkoholmenge. Leipzig, Engelman, 1907. 115 p.

ONE CHILD'S STRUGGLE IN THE PREPARATION FOR LIFE

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The grade system takes no account of different mental tendencies. Forcing all types of mind to conform to a grading which suits the average ability in each branch, we are puzzled and indignant because the boy who loves history and literature but hates the incomprehensible maze of arithmetic grows surly and careless when repeatedly held back from possible success on account of his standing in a subject where failure is inevitable.

Once a year we confront certain children who have made good effort and have gained much but not enough to meet our measuring standard, and we say to them that because they have not accomplished more it is as though they had done nothing, they must go back to where they were a year ago and start again.

The child who falls below the average, demands our most patient and earnest study. Is he handicapped by sense defects? Does he have an unusual type of mind not touched by ordinary means but alive with interest upon some out of school topic? Has late entrance into school forced an association with younger children whose less mature attitude is a constant annoyance? Has an ignorant blunder on the part of some teacher left a mental confusion through which clear ideas cannot struggle? Has especial sensitiveness or shyness caused the child to be unduly dominated by the personality of some one in authority? Has he had to deal with especially cramping conditions at home or at school?

Unceasing must be our effort to penetrate into the darkness of the unawakened mind and to search for the spring which may cause illumination. Training, as Mrs. Booth said of "saving," cannot be turned off by machinery. "It must be done by hand."

It is with the hope that some other teacher may be inspired with greater interest in making such efforts that the following record of one case is given.

In February, 1912, I began to tutor H—— D——. The child, eight years and nine months old, was in the second grade and was a source of great anxiety to both parents and teachers. Her class teacher felt confident that she was not defective, that she "could if she only would," but said that she was doing no good herself and, lacking self-control and concentration, proved a constant annoyance to the class. Severe discipline rendered her less obtrusive but called forth no desirable self-expression.

She could not read a sentence without blundering and miscalling words, and could not be depended upon to spell even the simplest word, although not infrequently she succeeded even with difficult ones. She could not write a page the meaning of which her teachers could decipher.

It was evident that she received too much help in any home assignment, this being due to the inability of an unskilled governess to hold her to her work at all without herself doing too large a share.

H—— showed a lively interest in general class topics, the study of primitive life, nature study, and the like, but she could not make an intelligent recitation because she spoke so rapidly and indistinctly and interrupted her own thought with irrelevant remarks.

The home is one of considerable wealth and good taste. Books by standard authors fill the cases. The family have lived much abroad. All speak French fluently and English with French rapidity. H—— had a French governess from her third to her eighth year and has since had a German governess who speaks English haltingly.

After a serious illness H—— was delicate for some time and had to be guarded from over-exertion. Habits thus formed were hard for the family to break after the need had passed. There lingered indulgence on the one hand, and on the other a helplessness almost prohibitive of independent thought or effort. Great advance has been made in this respect. She not only attends to most of her personal needs but shows gratifying ability to carry small responsibilities imposed upon her.

Excessive carelessness and lack of concentration were the mother's complaints. "We drill her on a certain word until she knows it perfectly and then she writes it all wrong. She is so careless. I do hope you can teach her concentration."

At last I was left alone with my problem, embodied in a blithe, talkative, well-developed little girl, with pretty manners and sweet seriousness not sustained for many consecutive minutes.

As her mother said, she was capable of knowing a thing many times and then missing it. She had the distressing fumbling habit, started with the wrong letter or too far in or up or down, and then scratched out untidily. None of her work was clear cut and exact, even in error. One paper had certain mistakes. The next corrected these but developed others. A third returned to some of the first and added new ones. Words of criticism had little weight. Obedience to details had never held a high place in her life, and so nearly all that she did was wrong that special points did not stand out in her consciousness.

Often she was very irritating if one regarded immediate issues.

" Spell robin."

" r-a-p "

" No, rob-in."

" i-n "

" No, no, rob-in."

" i-n, r-i-n Rr - x What's x for? Is it any good? What are those little spots on the paper? Why must I spell robin? What is spelling good for? Oh, listen, I was in the park and———"

I saw at once that the only possibility of success lay in my so analysing the situation as to work on its separate elements and help the child to see a few of her difficulties singly and face them definitely. She was completely overwhelmed by the complexity of what was to others a simple requirement. Foredoomed to failure, even her sincere efforts won her no encouragement through which she might advance to sustained endeavor. Often knowing that she had " tried hard," she was pronounced " careless " and saw ill-concealed irritation on the faces of those about her.

" What is carelessness of this sort? " I asked myself. I had recently taught a mature woman of good manual dexterity to knit. She mastered the conditions in about two minutes. She enjoyed the work and was eager to make a jacket for her baby niece. Yet she dropped stitches, added new stitches, and had to ravel out her first two day's work. The mistakes were all " careless " because she knew better. None of the motions having become reflex, she must give her direct attention simultaneously to eight fingers, two thumbs, two needles, and the yarn, and one or more was neglected.

" First then " thought I, " to treat such carelessness as a moral issue and blame and discourage the child because of it is a grievous wrong. I must be far more than patient with her and show her how to be far more than patient with herself."

For the patience so highly extolled in mothers and teachers I seldom feel enthusiasm. The very word implies resistance to the temptation to be vexed, and I have always observed the tendency of nerves thus strained to snap at important crises. Buoyant determination was more to our purpose. We must both, H—— and I, be so engrossed, she in the slow but conscious mastery of her powers, and I in my scientific study and loving motive, that irritation would be impossible.

The Binet tests showed a mind above the physical age, but it was struggling with strange handicaps. I began to feel my way along the paths described below. Naturally no one element was worked out separately. Each day contributed to my discoveries in all, and these in turn threw light upon other fields. But I shall mention them singly as the simplest way to describe a complex situation.

I. H——'s glasses were said to be very weak and their regular use unessential. Brief observation of work with and without them convinced me that they were of appreciable assistance. I requested her to wear them during my lessons and to take them to school As the weeks passed, however, I became assured that the glasses were not fully corrective. In May H— —was taken to an oculist and her glasses radically altered. She now wears them continuously. Her work is gradually improving, but there has been nothing sufficiently decided to make one feel that the glasses were a determining or even an important factor.

It is especially important that her eyes should transmit correct messages, since she evidently forms visual images of a certain kind very readily. She is constantly discovering fish, birds, heads, and other forms, in clouds, blots of ink, torn edges of paper and elsewhere.

II. Left-handedness. For some time I rated this feature as of first importance. Perhaps I placed it too high. This is a subject upon which I especially desire information.

H—— has always displayed the most marked left-handedness, a characteristic inherited from her father. It was with great difficulty that she learned to tell time, turn a knob, without trial, or form any concepts involving a right-ward impulse. She had been taught to use her right hand in writing and therefore it was rather a mental one-sidedness which I first discovered. When it seemed hopeless to get her to write words I had her take anagrams. After brief study, perhaps two minutes, she could accurately and rapidly arrange the letters to make four words, e. g., weave, basket, rug, carpet, but she began with the last letter and built backwards, sometimes at the last of a syllable and worked both ways. Not only did she fail repeatedly if asked to write these same words, but I found that she was silently reproducing the word as it appeared with no transition to sound in her mind. She did not know the words which she was making, denied that she had just learned to spell weave, declared that the second word meant the first meal of the day, and the like. In attempting to write she frequently began with the right letter and mixed the others, e. g., c-p-t-a-r-e for carpet. A few times she began with the wrong letter and when I said distinctly "'car-pet,' what is the first letter?" she would reply with puzzled impatience, "I was going to put c at the first end, but I haven't got there yet."

I spent a morning with her class at school. They were cutting Easter bunnies from tinted paper, the pattern being pinned up in front of them. All in the part of the room near me turned theirs in the same direction as the model. H—— reversed hers. The teacher assured me that she was not regular in such exercises and that the circumstance was merely one of her erratic chances, furthermore that it is not unusual for right-handed children to do this. I thought her doing it at all somewhat significant, but I do not know. Usually when I had her represent diagrammatically an absent scene or picture, she reversed the relative positions of the objects.

Since left-handedness is known to indicate a difference in location of specialized brain centers, I am inclined to feel it wrong to force the right hand to perform the activities which are natural to the left. The objection seemed particularly strong in a case so pronounced as that under consideration. To gain information on this point I consulted the psychology departments of three universities. The letters were far from conclusive. The gist of their opinions may be gathered from the following quotations.

> "I find your case a very troublesome one. Your description shows a decidedly abnormal case. The specific symptoms relating to left-handedness and inversion of right and left are very puzzling, and certainly suggest some peculiar lack of coordination between hand and brain. Whether these symptoms are primary or the resultant of some other defects is hard to make out. I do not think that the question of changing back to the left hand represents the whole issue. In general it appears best to let such children follow the natural bent in order to gain the maximum efficiency, and with this once established it is easier to suggest conformity. I do not think the securing of right-handed skill in this case worth the effort it would entail. In other words I do not think that the account at present indicates the nature of the difficulty."

> "—— is of the opinion that your little pupil's difficulty in distinguishing right from left, in telling time, etc., has nothing to do with the fact that she is left-handed, but is merely indicative of a state of mental confusion which is likely to clear up under persistent training as she learns to give attention to her work. He thinks there is no reason why she should not be taught to write with her left hand, if this hand has the better co-ordination."

> "I do not know of any useful literature on left-handedness and right-handedness, but I am sure that your little girl had better be allowed to use her left hand in future, and that it was a mistake to have her use the right in the past. Do not let her get worried or disturbed in your efforts to counteract the spoiling she has so far received. If her general intelligence is good I would not be disturbed about right and left confusions."

H—— always begged to draw with her left hand and was allowed to do so at school, but when I told her that she might write in the same way if she wished, the little person herself disapproved. "It was so hard to learn to use my right hand. I think it's a pity to lose all that trouble. It might break the habit."

Very recently I have been told by Dr. Wallin of Pittsburg University that there is some reason to believe that the forcing of a left-handed child to use his right hand induces speech defects. It is his opinion, however, that when the right hand has been used for some time with the consequent training of brain centers, the confusion would be enhanced by changing to the left.

H—— liked arithmetic better than any other subject and in oral work she was sensible and fairly accurate. Her written work was poor because she "carried" in the wrong direction and reversed the tens and units figures, e. g., 81 for 18. Looking very rueful she would say, "But the 8 does really come first." I helped her to overcome this by remembering that in all the teens the 1 stood next to the window.

Gradually the most obvious evidences of the reversed field were eliminated. I insisted that words made with anagrams should be built up letter by letter from the left-hand end, and in all our work I tried never to disregard a false statement of position.

III. Hearing, auditory images, detection of tones. By the watch test or response to whispers and low tones, I have detected no deafness in H——, whose hearing is supposed to be normal, yet she is extremely "tone deaf." A skillful music teacher has worked with her for months to get her to distinguish notes on the piano. She has no sense of rhythm, cannot carry a tune, and a year ago rhymes meant so little to her that she could not tell where the lines of poetry ended. In this she has greatly improved.

When this inability to recognize sounds first became evident to me I thought that she confused similar letters, e. g., m and n, l and r, brind for blind, and the vowel sounds. But it soon developed that she had great difficulty in distinguishing between letters so unrelated as k and t, m and nd, th and wh. Being told to remember "there" she would, after a few minutes' interval repeat "where" or "when." Asked to select from a group of words, e. g., ring, found, grow, and think, the words rhyming with flow and ground, her chances of success or failure were about equal.

"Do 'and' and 'bound' rhyme? Why not? They both end in nd."

Next day, "'Plow' and 'ground' rhyme, don't they?" Then wearily "I don't seem very strong on rhymes."

She suggested that I drill her on her phonetic cards to which she had been led to attach great importance. This was at the time when I felt that some lack of control of the vocal organs caused her to be unable to make certain sounds. However, the sounds of all the letters and combinations th, ck, ing, ch, etc., clicked off as rapidly as I could manipulate the cards. There was no speech defect in the ordinary sense. It seemed to me that this exercise had failed in the beginning to form associations in her mind with practical applications, just as tables or other forms may be memorized as isolated facts. It is recognized, not only that such knowledge does not function, but that it is far more difficult to form the associations later than it would have been before drill made the response so automatic.

This seemed to me to explain in part the fact that difficult words were often recognized in reading when easy ones were miscalled. Their peculiarity made an appeal to her consciousness which the mere combinations of phonetic elements did not make.

Sometimes, but not regularly, she could be made to sound the elements of a phonetic word, but she frequently made the most ludicrously distorted faces in her efforts to combine the sounds into a word. Gr-ow and gr-ew, for example, afforded us weeks of practice and are not yet mastered with certainty.

When through imitation she could be induced to place her lips and tongue correctly for the desired sound she promptly named the right letter.

It was weeks before I fully realized to what an extent she had conceived false images of common words. I have wondered whether the foreign languages which she has heard and spoken rapidly and indistinctly had any bearing on the situation. She was surprised, annoyed, indifferent, and finally ashamed and vitally interested at the discovery that she "did not even know how to talk." She had "A hansen book of Robberloo Steefuse's pomes." "Her grammother" lived with the family. An "obolust" fitted her glasses. She played with "Effel." She had six "zampols zakly" right. They went to the "drubburst" for soda water. Sentences begin with "captofal" letters. It is only very recently that she can detect a difference between singulars and plurals.

It is evident from examining the above list that she was not unable to say the th or v or f or t. She simply did not hear those sounds in those particular words. It seems scarcely reasonable to associate this peculiarity in speech with the treatment given her left-handedness, since the misconception of words manifested itself before she was taught to write.

In this field has lain my most definite and persistent work, and it has not been altogether without results. I made a type-written list of the words which she mutilated in her conversation. This we practiced daily. Each day I took the school assigned spelling lesson and made her spell all the phonetic words without study. This has given her a great sense of power. I taught her to watch my lips and herself to pronounce each word very clearly. When she was given the remainder of the words to study she knew that there was some important point for her to notice in each, thus associating the study of spelling with close observation of details, an idea hard to attain when "phonetic" and "hard" words are given together. Anagrams have been of great assistance. When she wrote I had her pronounce each letter aloud as she made it, so as to insure all possible impressions. I never allow her to copy a word several times for study without thus repeating the letters aloud.

We played games of observation to see how many words she could see in ten seconds, how many tall letters were in a given set, how many loops and the like. I have avoided letting her look at the paper with mistakes on it, but instead have written correctly the words on which she failed and have given her my copy to study.

Absolute failure is not unusual. After she has heard and said and studied "fruit" with all the methods I can devise for producing distinct visual, auditory, and muscular images, she suddenly writes it "f-l-u-i-t," and asked to say the word replies "floot."

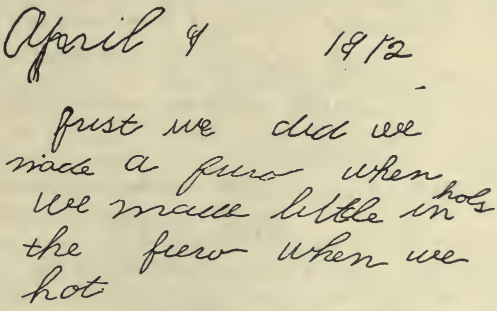
Despite her poor manual control which results in the poor form of some letters, H—— seems to me to have the making of a good writer. She prides herself upon holding her pencil very loosely and making nice large letters with round sweeps. Her false strokes and much scratching out made her papers untidy for a long time, but this was rather because of the uncertainty of what she was to write than a defect in penmanship. Recently she has acquired pride in her "nice, clean words," which look as "decided and smooth as if a teacher had made them."

Dictation exercises given for the purpose of teaching correct form in the written page she disliked so much that their execution was perfunctory and practically valueless. She wanted to be saying real things, yet the difficulties were so great that she could not make us know what her smears and false strokes meant.

One day her teacher gave me the following "composition" which H—— had written at school. I showed it to her saying that we could make nothing of it, and refusing to allow her to explain. She was to make it intelligible by writing. I was to sit behind her and not see the paper till it was finished, but would write any word for her to copy. Such words were to be underscored to indicate their not being hers. The second trial shows the result. The checked words she spelled herself with assistance, i. e., by having me speak them very distinctly but not say any letter.

I then wrote the sentences at her dictation and after studying my paper she produced the "third trial."

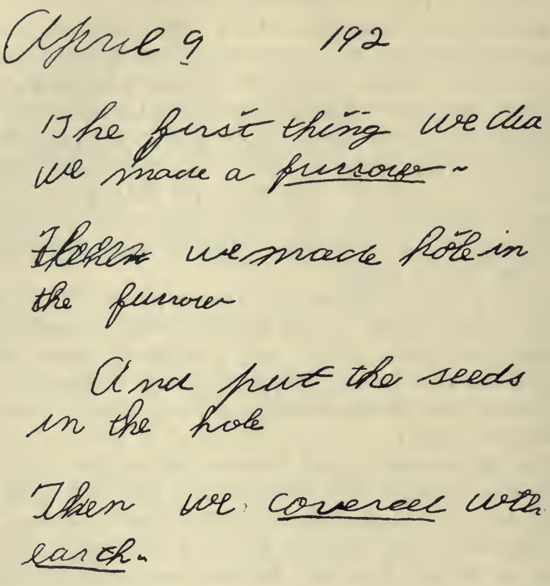
FIRST TRIAL



April 4 1912

frust we did we
made a fure when
we made little in hols
the fuero when we
hot

SECOND TRIAL



April 9 192

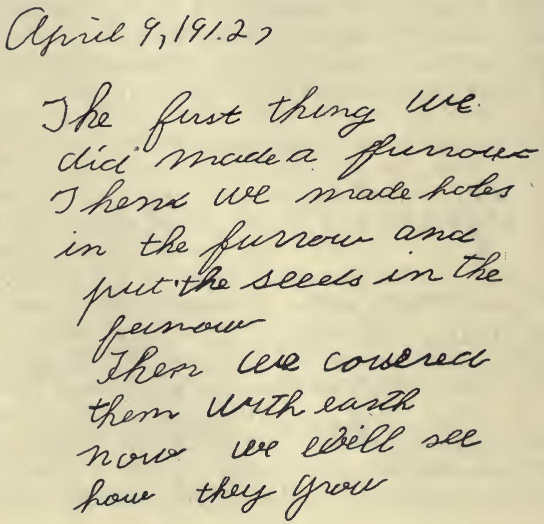
The first thing we dia
we made a furrow -

~~Then~~ we made hole in
the furrow

And put the seeds
in the hole

Then we covered wth
earth.

THIRD TRIAL



April 9, 191.27

The first thing we
did made a furrow
Thend we made holes
in the furrow and
put the seeds in the
furow
Then we covered
them With earth
now we will see
how they grow

Since that time we have executed many compositions, to her increasing delight. There is never a dearth of topics or subject matter; for her mind is ever alert and little escapes her quick eyes.

In response to her desire to give to her writings a distinguished appearance she even gave heed to margins and headings, and she now takes dictation lessons in the spirit in which they were planned, as formal training to help her when she needs to have her mind free for subject matter. Not content with humdrum sentences she tries picturesque expressions.

"The Indian must needs."

"But you don't talk that way."

"I know, but let me write it. I love to. It sounds so quaint." "Will you show me how to put in the little marks to show that he is talking?" "Can't I *puncherate* it to show that he was glad?"

Hard words are copied in silence so as not to interrupt the thought. Her accurate copying has been a source of interest to me. Increasingly she attempts words herself, or turning gravely watches my lips in silence. "Will you say 'leaf' for me? I don't know whether to make l or f first." "Is it m or n in farmer?"

It is a curious fact that while my efforts served to push her past the barriers where she seemed hopelessly lodged and to give her power to advance, they did little towards removing the specific stumbling blocks associated with past confusion. She seldom reads "where" without first calling it "there" and in any spelling lesson the words missed are usually those on which I drilled her ineffectually nearly a year ago. Written spelling still lags far behind oral.

We think of the reversed field as largely overcome, yet occasionally she fails to tell time because she feels the hands as moving backward, adds the hundreds column first, writes "04" for "40," or calls "ashes" "sashes," i. e., starts with the sound of the letter at the end.

In the beginning I was amused at being asked to teach "concentration." As the weeks passed H—— and I were so busy that I finally awoke with the startled consciousness that I was not planning for this point at all. Concentration is not an end, but only the evidence of an absorbing interest aided by effective habits of study.

From the first we attended rigorously to business. "No, never mind that now. Put on your glasses. You have rubbed them enough. Ready, spell robin, now sparrow; don't look out the window, now nest." But from the first we had a great deal of fun, for I strove to invest each act of drudgery with all possible interest. We must all learn to will to do unpleasant things, but I doubt our being greatly helped to do them by our own will through being forced to do them against our will.

Two daily record charts which H—— herself marked with red ink on coordinate paper afforded great delight and a tangible means of measuring progress in certain lines. One showed the number of words correctly pronounced in one minute from the typewritten list already explained. The second chart set forth in glowing colors the number of examples like the following, added correctly in five minutes:

36	67	42	52	35	42	93
45	84	65	68	74	62	62
72	35	27	95	36	85	68
—	—	—	—	—	—	—

Beyond a brief introductory word of advice nothing was said to repress talk during these time tests. But such interruptions obviously hindered in breaking records and soon ceased. That was a proud day for us when H——'s father entered the room and after a glance at my warning finger retired in puzzled silence to a window while the little girl added on intently, and exceeded her past record too.

"I didn't just not talk," she said eagerly, "I thought, 'I must add, I must add,' and I did more than ever before."

Life cannot be all play, however. Stern drudgery comes to all of us. There were days such as the one on which I said, "I have told you again and again to be careful about your s's, and you are not trying at all. Now make a whole line of s's."

"Wh————y?"

"Because I say so and right away,————Now another."

"Why?"

"Because you waste time saying, 'Why?' and don't make them well. Now another."

Nor would children have a world all play and caprice if they could. We wrong the little men and women in the children when we assume that they must be forever amused, and we are often humbled at the discovery of what earnest little men and women they are. I was especially impressed with how much keener interest H—— showed when she saw the inner purpose of a task than when the fun was merely that of a devised game.

One phrase in a letter quoted above was often in my mind, "Do not let her get worried or disturbed——" and I strove to shield her from the overwhelming sense of failure which may easily come to hang like shackles about such a child, and to point her to the light ahead, "You failed to-day, but to-morrow you will do it."

This was far from easy, as she was by no means in the pathetic stage of discouragement. Constant reiteration of her faults was already bearing its most dangerous fruit in making her defiant or self-assertive. She was intoxicated by the most moderate praise and ceased from all endeavor in order to bask in the unwonted sunshine. To keep her courage high through daily failure and yet not develop overweening conceit and passive satisfaction in petty achievement taxed my resources to their utmost.

I worked for intelligent cooperation. The purpose in much that I did was so far beyond her that she did not even wonder. But whenever possible I tried not merely to let her see my immediate end but to enable her to catch a glimpse of the ultimate issue. For a long time we had been working on clear pronunciation. I constantly trippped up her conversation, often greatly annoying her. One day she was repeating the word after me with almost sullen indifference. "No, no, H——," I said, "you mustn't think it does not matter when I try to make you speak correctly. If I can teach you how to talk you will almost know how to spell. For instance, spell this word we were just saying—violet."

"It is too hard. I never studied it."

"I know, but spell it."

"v-i——o" a deep gulp and duck of the head, "l-e-t."

"Now spell capital."

"Can I spell that?"

"Certainly."

"c-a-p———i———t-l-e, tal, tal, no, t-a-l."

"That is correct."

"Oh!" she cried with face all aglow, "I'm learning to spell, I'm learning to spell."

Next day when I corrected her on the pronunciation of her little friend's name she laughed gaily as she answered, "Ethel." Then roguishly patting my arm to keep me quiet she continued, "And an oc-u-list fitted my glasses, and I begin with cap-i-tal letters, and I went to the druggist," etc., etc. A moment later, "Could I spell all those words?"

"Probably not."

"Do you think I could spell half? I'm learning to spell pretty fast."

This was very different from her former flippant conceit. It was a piece of self-knowledge and realization that among the many faults she was consciously attacking and overcoming certain ones.

After a summer of play and desultory study with a governess, H—— returned to school in good health and with the desire to do her work well, but with much of her former roving attention. The slightest sound diverted her.

It was impossible to promote H—— to do the regular Third Grade work, yet she was too old and sensible to make a repetition of Second Grade desirable.

By a special arrangement she was received into the Fourth Grade of our Open Air Department with the understanding that she should be helped to advance according to her own needs in each subject.

Easily keeping pace with the Fourth Grade children in geography, history, and literature, when the text was read to her, for several months she had all her reading and spelling alone. During the year she has covered Third Grade arithmetic, except that her poor form makes written examples very hard to attain. Her reasoning is good. Her inattention was speedily overcome to a very marked degree. It frequently happened that recess was the only time in which her special reading lessons could be arranged, but the little girl never uttered a word of complaint when led away. "Here I am, Miss ———," called her cheery little voice as she caught sight of the teacher with her book. She read steadily within sight of her playing companions. Teachers and pupils united to drill her on her Tables and I have more than once had to interfere when all her play time was preempted to finish an unreasonably long task assigned by an older child. Not only did she never complain but reported the fact if she was too long neglected. "I will get backward if no one asks me anything," she said.

By the first of February she was reading well in second readers, frequently miscalling words but generally able to correct herself, her running comments meanwhile leaving no doubt of her thorough understanding.

About the middle of February she was started in a third reader. But at that time the Fourth Grade began "Viking Tales." H—— was entranced by the story, annoyed when a child read haltingly or did not give the meaning, and more and more strove to follow the story on the page before her. One day, with a sudden inspiration, she begged to be allowed to read, and with a sudden inspiration the teacher consented. The performance was not a perfect success but it was far from proving a failure. At the end of the lesson she was ready with a new request, if she took the book home and prepared what was sight reading to the others, would she be permitted to read with the class? The battle was won that day as far as reading was concerned, for she has read with the Fourth Grade ever since, soon at sight with the more advanced section.

In April I found her in the back of the room, reading softly to a child who was unable to use her eyes that day, and stopping to explain, " May be if S—— could use her eyes she could read better than I could, but she doesn't know what it means, so what's the use? I just splain it to her."

The difficulty which seems to me now the most baffling is the child's inability to receive, retain, and reproduce distinct words. I cannot understand how she can have so clear an appreciation of what occurs around her when the language which is the vehicle for most of our expression buzzes about her so inarticulately as it seems to do. There is seldom a day when she does not ask me the meaning of some impossible word which she has understood to be said in a recitation or conversation, often combining two or more words, e. g., watell for " wait till." Ideas seem the essentials but it is difficult to advance satisfactorily without some terminology. I am pleased with her multiplication and division, but I could not help being distressed at the discovery a few days ago that despite my efforts to speak very clearly she is talking of " mulipation " and " vision." It is out of the question to spend weeks of drill on every new word.

With obviously clear understanding, expressive gestures and excellent illustrations, she cannot relate the simplest incident without slurring her words till they are barely intelligible and frequently asking for help with names or big words. " And then M——, what was the little Japanese girl's name? " " The water comes rushing through———what do they call a 'specially big, deep valley? " I entered the room recently when the class was trying to trace the course of the Delaware river. Her finger followed the crooked black line readily enough but at the same time she was making ineffectual efforts to explain an experience of her own during the summer. Knowing that I knew the facts she hailed me to her assistance. " Where was I on that trip last summer? Something about Delever? "

" At the Delaware Water Gap," I said.

" Oh, yes," she exclaimed to the class and teacher, " I was at the Delerergap."

Even more puzzling is it when in reading she calls a word something totally wrong, e. g., says " potatoes " for " pictures," but looks up with a perfectly sensible remark about pictures.

The sound and sensation of saying "potatoes" does not make it impossible for her in some way to gain the correct idea from the symbols before her eyes.

In writing, the advance is much less rapid than in reading. In any original production her mind is so full of what she wishes to say that she dashes heedlessly on with little regard to form, not even taking time to realize that she needs to ask for help. The results, though often better in thought than those of most of the class, are indecipherable by any but the initiated teacher, and not wholly intelligible to her. Poor H—— looks very foolish and rueful when forced to listen to the jargon of sounds produced when such a composition is read literally according to the letters set down.

In dictation exercises the advance is more gratifying. It is disconcerting to see her write d-o-r-p, at the end of a series of exercises about a rain drop, with drop correctly spelled a dozen times, or to watch her read "dark" and spell it to herself d-a-r-k and then write drach. Yet we now feel that it is fair to count these mistakes as careless, even though the child appears to be trying, for, when sufficient stress is laid upon accuracy and she is held to this task for some time to the exclusion of more pleasant experiences, a practically perfect paper results.

One of the most instructive features of her case, because of its reflection upon conventional school grading, is the fact that since she is not held back in all subjects to the level of her lowest attainment, she is no longer troublesome. Happy, alert, full of ideas, she has ceased to be a noisy or officious member of her class. Instead of selfish disregard for the rights of others she expresses the kindliest feeling and recognition of just relations.

It is our hope that, with much special consideration for her weak points, she will be able to do reasonably strong work in the Fifth Grade next year.

The following specimen of her independent work shows her improvement. It is the first paragraph of the reproduction of a story.

may 15 1913 H——

The Wind and moon

“I hate to be stared at in the face” said the wind to the moon. The Wind said; I'll blown you out and then You will not stare at me on I will blow you out one tow there and here! you go out The wind blew hard and went the moon The wind said The moon its out now I can Sleep now,

ORDERLY ASSOCIATION AS A CONDITION OF MENTAL HEALTH

By Wm. H. Burnham

The essential conditions of healthful mental activity are many, both physical and psychic. The problem of determining these conditions is so complex that its solution seems well nigh hopeless, and yet here modern psychology comes to our aid and suggests certain unifying principles (6). Two of these are of fundamental importance, namely, the following: 1. Attention to the present situation; 2. Habits of orderly association.

The most primitive and fundamental mental function is perhaps what we call attention. While structurally attention means clearness, genetically and functionally it means a reaction of the organism comparable to the tropisms in plants and animals. The usual form of attention is reaction to a group of stimuli immediately present, what may be called the present situation. The type of *healthful* attention is everywhere attention to the present situation. So important is this for the mental health that one's ability to concentrate upon the present, ignoring the past and the future except as vitally related to the present, is in a certain sense, a gauge of one's sanity. This was pointed out long ago by Janet, and the importance to health of living in the present has been emphasized recently by Dr. Osler in his lectures at Yale. "Sufficient unto the day is the evil thereof," represents the soundest mental hygiene, and the danger of ignoring this is shown by modern psychiatry.

In the border line neuroses, e.g., the patient worries about the past or has grave anxieties about the future. The beginning and the cause as well as a characteristic symptom of mental breakdown is the habit of doing things, as Pres. Hyde has suggested, three times, which should be done but once: 1st, doing them in anticipation and dread; 2nd, in the actual occurrence; 3rd, in worrying about them afterwards and regretting that they had not been done differently.

The second fundamental mental function is association. The law of association in the mental world has aptly been compared to the law of gravitation in the physical world; and for the mental health, orderly association is of fundamental significance. Conversely, if we should attempt to sum up in one word the things that menace the mental health, this might be done best perhaps under the term interference of association.

From a practical point of view these two principles are one, because attention to the present implies orderly association; and on the other hand, habits of orderly association presuppose attention to the present situation and make this easy and natural. In fact, attention to the present situation is often the best possible device for avoiding interference of association. This has always been the refuge of men in times of crisis and the anchor of sanity and health in the stress of intolerable circumstance. The mental attitude is what Plato called singlemindedness. While attention may be distributed, it should not be distracted by the complexity of a situation; and from such singlemindedness or unity of attention will be developed habits of orderly association in distinction from interference of association, which commonly occurs as the result of bad training, extreme fatigue, and nervous disorder.

INTERFERENCE OF ASSOCIATION

From the point of view of mental hygiene the chief aim of education may be said to be the development of right habits of association; and the avoidance of interference of association is the most general negative rule in mental hygiene. What is signified by this can be shown best by illustration. We find interference of association in an infinite number of forms from the conflict of simultaneous stimuli in the nervous system and the relatively simple interference of incipient motor habits up to the confusion of thought in the individual who is worried or rattled or the patient who suffers from the insanity of doubt. It is illustrated in the most ordinary experiences of daily life as well as in experiment. A few concrete examples may be helpful.

In many forms of experiment in the laboratory we have simple illustrations of interference of association. Bergström (3) found it in sorting cards, where in the first half of the experiments the cards were sorted into ten piles located in a certain way, and in the second half into piles differently located. Bair (2) in experiments with the typewriter and in sorting cards, noticed the same, although his results led him to conclude that there is less interference than Bergström found; but he also found evidence that "diverse associations become automatic with practice and that the neural disposition of the old habit does not vanish when a new one is formed." Müller and Pilzecker (20) found that when a series of nonsense syllables has been learned, a later test shows that less is retained in case a task demanding concentration—the careful consideration of pictures, for example—be given the observer immediately after the learning. Culler (7) in more recent experiments with the typewriter and in repeating Bergström's experiments, found that " interference is an incident in the course of automatization of the two opposing associations." Interference is found also incidentally in many laboratory investigations, and it is illustrated in learning typewriting, stenography and the like. It is liable to occur anywhere during the processes of learning before the series of associations is thoroughly organizezd.

Laboratory experiments on the acquisition of skill furnish innumerable illustrations of the law of interference of association; and the recent investigations by the so-called *diagnostische Assoziations-methode* (17) give noteworthy examples. Specially significant is the fact that if the associations have a distinctly affective character, interference is likely to result. The normal association reaction time is from one and a half to two seconds, but where the associations arouse distinct feelings, the reaction time may be six or eight or ten seconds. If, for example, the associations concerned relate to the affairs of one's own family, especially if there be domestic friction or the like, or if a crime has been committed, or if for any reason strong feeling be involved, the association reaction-time is likely to be enormously lengthened. Thus, some have rather hastily inferred that the association method can be used in the court room to determine the guilt or innocence of a prisoner on trial. The reason for this lengthened association reaction-time is the strong feeling aroused, at least, in many cases. But, on the other hand, there may be a lengthened reaction-time for many other reasons, and anything, in fact, which causes interference of association is likely to lengthen the reaction.

Such experimental results show in the most emphatic manner, in the first place, the great waste of time when interference of association occurs, and from a hygienic point of view the great stress and strain likely to be involved in the mental processes wherever interference occurs; even when a minimum of feeling is involved, the mental process is allied to the arch enemy of the mental health, namely, worry.

Perhaps the most important point hygienically is the relation of interference of association to feeling. Whenever attention to two things is demanded, one of which is strongly affective in character, interference is sure to occur. And while feeling causes interference of association, interference, on the other hand, is usually the beginning and a condition of feeling.

Interference of association is most vividly illustrated by numerous pathological cases. In extreme instances the patient seems to be always thinking of two different things at once, and clear-cut reactions are impossible. The so-called imperative ideas are often so many cases in point. The various phobias, pyrophobia, fear of fire, mysophobia, fear of dirt, claustraphobia, fear of open places, and the like, furnish examples. The extreme form of interference of association and worry is well illustrated by the so-called obsessions. These occur in great variety from obsessions in regard to one's physical health or one's soul's salvation to the slight temporary obsessions where a nonsense rhyme or an absurd image persists in consciousness.

The pathological and the bizarre, however, merely paint in lurid colors the normal. Every association of ideas is to a certain degree imperative. This is admirably illustrated by an old story probably often quoted. An alchemist, so the tale runs, discovered a formula of mystic words which enabled one to turn baser metals into gold. Only this condition was essential, namely, that when one repeated the mystic formula one should not think of a hippopotamus. On this condition it was sure to succeed, but no one ever made gold by using it because no one was ever able to comply with the necessary requirement. This story illustrates the imperative character of our associations. In a certain number of cases, if we have once seen or heard the irrelevant, interference of association is inevitable; in all cases it is possible. If our minds have once wandered to the unessential, such ideas are always liable to come up to our confusion. This is the tragedy of education. Inaccuracy in learning, the mistakes of a poor teacher, the results of a slipshod method, can hardly be atoned for. If a child associates a wrong pronunciation with a word, or makes an erroneous association in arithmetic or falls into error in grammar, the wrong association is almost sure to be remembered and causes confusion even if actual error does not result. The pupil cannot escape from it. He may know what is right, but the erroneous associations come to mind first and cause interference.

Many normal people are never straightforward in their processes of thought. They are always thinking of two things at once; or if one subject holds the focus of attention other things are in the background or indirect field of consciousness and liable always to interfere and cause distraction. All of us at times have this experience. Waiting for an important engagement, a forgotten duty, uncertainty about a verdict, unfaithfulness to an ideal, and the like, are occasions for it; and every individual in the stress of circumstance from the collapsing financier to the rattled baseball player furnishes illustration.

Even in our recreations and athletic sports interference of association is likely to be the most serious menace to success. Of drop kicking in football, Brickley, the Harvard football player says:*

> "The 'concentration' part of it comes when you are receiving the ball from the centre. Then the least fumble or juggle is pretty sure to kill the kick. If while you are waiting for the ball to come back you happen to see something go wrong in the line or get the feeling that your protectors in the backfield are not in just the right places, there's a big temptation to let your mind wander from the business at hand. Even after the pass has started, these things seem to flash across your mind. If you let them jar you or if you let any sort of an interruption 'get you' you're a goner. Nine times out of ten the kick goes wrong.
>
> "A great many times you will get a kick away thinking of nothing else than that some one of the opposing linemen must have been offside or else he could not have broken through so swiftly. If you let it worry you the kick is sure to go bad. As a matter of fact if you had your eye on the ball you didn't see it at all. You 'sensed' it. Anyway, drop kicking depends, to my way of thinking, upon keeping your eye and your mind on the ball from the moment you have taken your position and sized up the angle and the distance."

Under certain conditions even attention itself may be the cause of interference of association. Too close attention to an action to be performed is apt to retard or inhibit it. This has been found in many experiments in the laboratory, in pathological cases, and in common experience. What the conjurer tells his audience is often true in daily life,—" the more closely you give attention the less you see." From such phenomena De Sanctis has formulated the law of contrary association. As he puts it, a certain forced exercise of the faculty of attention inhibits and removes the idea to which it is directed and thus favors a contradiction and a predominance of the contrary association.

This law of contrary association has a wide application. The extreme cases of interference of association, as seen in certain forms of nervous disorder, are perhaps cases in point. Neurasthenics sometimes complain that they see the opposite word to that desired, and the impulse to blasphemy and the like in cases of religious neurotics are also noteworthy. In a case reported by Dr. Pick,* the patient presented among other symptoms that of giving a contrary reply to questions asked. The following conversation gives an illustration:

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* *Boston Sunday Herald,* Nov. 17, 1912.

* Journal of Nervous and Mental Disease, vol. xxxi, No. 1, Jan., 1904. pp. 1-14.

"Have you a Christian name?" "No."
"Then you have no Christian name?" "Yes, Joseph."
"Are you married?" "No."
"Then you are single? "No, I am married."
And again, "Do you know the examiner?" "No."
"Hence you do not know me?" "Yes, I know you."
"Do you always behave so?" "No."
"Then you do not always act so?" "Yes."

In some of the cases reported the contrary reaction seems to be due to purely motor interference. A case was reported by Meschede where a forced movement was always carried out in the direction the opposite of the one intended. This occurred only when the patient himself intended to move or when he was ordered to do so. If the patient desired to look to the left, the eye-balls turned actively toward the right. If the patient attempted to look upward, both eye-balls immediately were lowered; and during convalescence, if we may trust the account, the voluntary movements of the entire body were in like manner carried out in a direction opposite to the one desired.* Dr. Weir Mitchell (19) has also reported cases of this kind, among them the following:

A naval officer after a period of unusual strain during the war of the Rebellion found that when on the landing of the stair-case intending to go up the next flight, instead of doing so, he found himself going down the flight he had just ascended and going down backward. Afterwards at long intervals and when over-worked such reversal occurred. "In the street if the action of walking suddenly ceased to be automatic and he recalled the fact that he was walking, he would sometimes walk backward a few steps, and finally recovering himself would go on as before. After a while he had great difficulty in ascending the stairs in the usual way, and was ordinarily unable without effort to go upstairs foremost. When he was alone he was apt to go up backward, and generally if not watched descended the stairs in the same way. He would go to a door to unlock it and would find himself making an effort to lock it."* This symptom was not a serious one; the man continued to be efficient in the ordinary affairs of life, and during the years of this peculiarity he served in the war with distinction. Another case was that of a lady who had the not uncommon habit of turning to the end of a book before she began to read in the usual way; later she had the tendency to go backward through the book with some mental confusion if she tried to read in the ordinary way. Another woman suffering from arterial degeneration and other physical disorder had the tendency to put her shoes on her hands or her gloves on her feet. An officer in the army worn out with service sometimes did the same, and instead of holding his knife in his right hand, held it in his left, although the left was crippled. A dentist had the habit of saying directly the opposite of what he desired,—out of doors, for example, when he meant indoors, a clear day when he meant the opposite. With change of climate and occupation he entirely recovered, and these reversals of statement ceased.

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*See Journal of Nervous and Mental Diseases, loc. cit. p. 9.

*Journal of Nervous and Mental Disease, Vol. xxxi, No. 4, April, 1903. pp. 193 *seq.*

The popular terms for interference of association are worry, nervousness, the conditions of being rattled, confusion of ideas, etc. While worry is a common form of interference of association, the latter is a much broader term, but a large group of illustrations are furnished by the experience of worry. Dr. Walton (29) has given concrete cases in an interesting and useful little pamphlet. A vast number of superstitions and idiosyncrasies on the borderline of the pathological also show interference of association in extreme form. The classic case in literature is that of Samuel Johnson (19) as reported by Boswell. As his biographer reports the case, he suffered from obsessions of various kinds, and at one time interference of association seems to have been a very common phenomenon. As Boswell describes it:

> "He had another peculiarity of which none of his friends ever ventured to ask an explanation. It appeared to me some superstitious habit, which he had contracted early, and from which he had never called upon his reason to disentangle him. This was his anxious care to go out or in at a door or passage, by a certain number of steps from a certain point, or at least so as that either his right or his left foot (I am not certain which) should constantly make the first active movement when he came close to the door or passage. Thus I conjecture; for I have, upon innumerable occasions, observed him suddenly stop, and then seem to count his steps with deep earnestness; and when he had neglected or gone wrong in this sort of magical movement I have seen him go back again, put himself in a proper posture to begin the ceremony, and, having gone through it, break from his abstraction, walk briskly on, and join his companion."

Some of Dr. Walton's illustrations are instructive here. For example, he cites the case of a man who leaves his office at night, and then it occurs to him that he has not locked his door. If he is a normal man he goes back and tries the door and then goes home and thinks no more about it. The neurotic, on the other hand, goes back and tries the door, and then is not satisfied, but goes back again and again. In either case as the man walks away from his office there is interference of association, but in the abnormal case it becomes chronic.

Of the doubting mania, Dr. Walton gives the following example (29, p. 89):

> "A gentleman once told me that after mailing a letter he would often linger about the box until the postman arrived, and ask permission to inspect his letter, ostensibly to see if he had put on the stamp, but in fact to reassure himself that he had really mailed the missive, although he knew perfectly well that he had done so. The life of the chronic doubter is full of these small deceits, though in most matters such persons are exceptionally conscientious."

The significance of such doubts for the mental health, Dr. Walton notes as follows (29, p. 93):

> "With regard to immediate doubts, if the over-scrupulous business or professional man, worn out after an exacting day's work, will stop and reflect, he will realize that much of his exhaustion is due to his having filled the day with such doubts as whether he is doing the wrong thing, or the right thing at the wrong time, whether he or someone else will miss an appointment or fail to meet obligations, and whether he or his assistants make many blunders."

Among the best illustrations of interference of association are the phenomena of normal and morbid conscientiousness. Men like Napoleon, to whom most matters are not questions of conscience at all, are usually clear in their thought and straight-forward in their action. Men like Amiel, to whom the choice of every phrase is a matter of conscience, are the extreme examples of confusion of association. Amiel's Journal in fact furnishes some of the best possible illustrations of such interference of association.

Of his difficulty in composing he says (1, p. 355):

> "I have been working for some hours at my article on Mme. de Staël, but with what labor, what painful effort! When I write for publication every word is misery, and my pen stumbles at every line, so anxious am I to find the ideally best expression, and so great is the number of possibilities which open before me at every step.
>
> "Composition demands a concentration, decision, and pliancy which I no longer possess. I cannot fuse together materials and ideas. If we are to give anything a form we must, so to speak, be the tyrants of it. We must treat our subject brutally, and not be always trembling lest we are doing it wrong. . . . I am always retracing my steps: instead of going forward I work in a circle; I am afraid of having forgotten a point, of having exaggerated an expression, of having used a word out of place, while all the time I ought to have been thinking of essentials and aiming at breadth of treatment. I do not know how to sacrifice anything, how to give up

anything whatever. Hurtful timidity; unprofitable conscientiousness; fatal slavery to detail!"

A similar interference of association may occur, of course, in any other occupation as well as in writing. As more time is spent in reading by most people than in writing, illustrations of habits of interference in reading are probably still more common. The latter are often found among children. George McDonald in *David Elginbrod* has reported an extreme case which, if it be not true, is truthfully invented. Hugh finds his pupil on the floor in a corner of the library reading the old romance of "Polexander," and the following conversation ensues:

"Do you like this very much?" said Hugh.

"Well—no. Yes, rather."

"I think I could find you something more interesting on the book-shelves."

"Oh! please, sir, mayn't I read this?" pleaded Harry, with signs of distress in his pale face.

"Oh, yes, certainly, if you wish. But tell me why you want to read it so very much."

"Because I have set myself to read it through."

"You should not set yourself to read anything before you know whether it is worth reading."

"I could not *help* it. I was forced to say I would."

"To whom?"

"To myself. Mayn't I read it?"

Again Hugh found him in the library, seated in his usual corner, with "Polexander" on his knees.

"It's no use; I *can't* read it."

"What's the matter, Harry?" said his tutor.

"I should like to tell you; but you will laugh at me."

"I shall never laugh at you, Harry."

"Never?"

"No, never."

"Then tell me how I can be sure that I have read this book."

"I do not quite understand you."

"Ah! I was sure nobody could be so stupid as I am. Do you know, Mr. Sutherland, I seem to have read a page from top to bottom sometimes, and when I come to the bottom I know nothing about it, and doubt whether I have read it at all; and then I stare at it all over again. till I grow so queer, and sometimes nearly scream. You see I must be able to say I have read the book."

"Why? Nobody will ever ask you."

"Perhaps not; but you know that is nothing. I want to know that I have read the book; really and truly read it."

While such extreme cases may be unusual, all children as well as many adults in the presence of an uninviting task are likely to show interference of association. An excellent illustration is given by Dr. James:*

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* James, Wm.: The Principles of Psychology. New York, 1890. Vol. i. pp. 421.

> "I know a person. for example, who will poke the fire, set chairs straight, pick dust-specks from the floor, arrange his table, snatch up the newspaper, take down any book which catches his eye, trim his nails, waste the morning *anyhow,* in short, and all without premeditation,—simply because the only thing he ought to attend to is the preparation of a noonday lesson in formal logic which he detests. Anything but *that!*"

This interference of association is often not clearly conscious. Many illustrations are furnished by the psychology of memory, in every day life. Freud (9), as the result of his investigations, maintains that our thoughts, our acts, our errors in recollection, our mistakes in speech and in act, are not mere matters of chance but are governed by definite laws. Specially what we recall is determined not merely by conscious association but also in large degree by unconscious or subconscious affective and voluntary processes.

In all of us there are innumerable deep rooted impulses, wishes and tendencies; some of them innate, others acquired; some of them conscious, more perhaps subconscious, repressed by education and convention, and yet capable of showing their force in unusual situations and especially when we are off our guard, as in plays and games, when, as is recognized by everyday psychology, one is likely to show one's real character. These are liable at any time to conflict with our conscious processes and to cause mental discord, confusion, or interference of association.

The outcome of Freud's study is to show the influence of the will and affective processes in recollection. The knowledge of this influence is not new, but Freud has shown how largely processes of will and feeling have an influence. This is most clearly and dramatically shown in pathological cases. If a person has been the victim of some shock or the like and had an experience repugnant to one's general character, this is likely to be thrust out of consciousness as much as possible, yet this repressed complex of memories remains like a foreign body in the mind, a thorn, not in the flesh but in the spirit, or a psychic lesion, as some psychiatrists call it. Such repressed memories may have a most disastrous effect upon the mental life, causing constant disturbance of the nervous and mental health, even when they have been so thoroughly repressed that the essential features of the experience have been forgotten by the individual. In all of us there are repressed complexes of ideas. Everyone has some skeleton in his mental closet.

The study by Freud (9, p. 131) of the psychology of everyday life emphasizes the uncertain line between the normal and the abnormal, and illustrates the way we are all subject to interference of association. It makes this concrete and definite. The distinction between the normal and the abnormal is specially this: that in case of the normal the symptoms of interference of association and the like appear in the least important psychic processes, while all which is of great psychic value is free from interference. In the case of the abnormal they appear in the most important individual and social processes, so that they may disturb nutrition, one's professional work and social duties.

The singleness of mind, the unity and harmony of the mental processes extolled by Plato, has been the desire of intellectual men in all ages and the passion of the saint and the devotee. This has been the reward of the man of one idea, the crank, the reformer as such, the partisan, the fanatic. In extreme form this itself has become pathological; but in most cases of mental disorder, especially in innumerable borderline cases, the characteristic symptom is conflict. This condition is of course common both among the normal and the abnormal.

Among the usual forms of such conflict are cases where the individual finds his maturer beliefs in conflict with his early training, or where one finds nature in conflict with convention, and what one believes to be right and natural in conflict with the customs of society about him, or where one finds his public duties or occupation, his business, in conflict with the claims of friends and perhaps with the most sacred domestic duties; or again, where one finds his interests and passions in conflict with social ethics and morality. Innumerable cases are given in pathological literature.

In accordance with the law of inertia, as Lombroso might say, or as a result of this passion for unity of the mental life, the individual strives in all such cases to reduce the conflict (14), and this is done in different ways. Among the chief are the following:

1. One method of settling conflict is a decision in favor of one side or the other. This is normal, and the person with strong character will be able in this way to unify the mental life, or at least to reduce the interference of association from the conflicting aims and desires to a minimum. Once for all having taken sides and having renounced all conflicting aims and desires, the unity of the mental life grows more and more perfect and temptation grows weaker and weaker.

2. In case of those who have not the strength of character and the clearness of vision to make a decision in favor of one side or the other, the method most commonly adopted is probably that of repression. As most men dislike to make

decisions, conflicting claims and desires and ideals are repressed, thrust out of memory as much as possible. All of us resort to this method of repression in a vast number of distracting situations, and a certain amount of such repression we are able to endure. When, however, the repressed complexes of ideas are too strong for the given individual a pathological neurosis of some kind occurs.

3. When the conflict becomes unbearable between the repressed complexes and the normal stream of thought, the former are more and more dissociated from the latter, and in extreme cases the dissociated complexes may become a secondary personality.

Dr. Hart, in his excellent little primer on "The Psychology of Insanity" (14), maintains that conflict is a fundamental factor in the causation of insanity. The pathological mind has lost the homogeneity which is the ideal of normal personality, and has become disintegrated into more or less independent portions. But this disintegration invariably owes its existence to the presence of a conflict. The mind contains elements incompatible with each other, a dissociation has arisen as a method of avoiding the storm and stress of the warring elements. It is biologically a refuge, a protection, one of nature's methods of dealing with conflicts which seem insoluble. Dissociation, repression, and the like, are secondary results not primary causes.

Dissociation itself, however, is to a certain extent a normal protection against interference of association. All of us have certain more or less water-tight compartments in our minds, and while this may not be an ideal type of mind, the dissociation does often protect one from confusion. Dr. Hart illustrates this as follows (14, p. 57):

> "Although the phenomena just described are so bizarre, and so characteristically insane, yet this dissociation of the mind into logic-tight compartments is by no means confined to the population of the asylum. It is a common, and perhaps inevitable, occurrence in the psychology of every human being. Our political convictions are notoriously inaccessible to argument, and we preserve the traditional beliefs of our childhood in spite of the contradictory facts constantly presented by our experience. Such phenomena can only be explained by the existence of a certain amount of dissociation, and, though less in degree, it is precisely similar in kind to the dissociation which permits the asylum queen to scrub the ward floor, serenely unconscious of the incongruity between her exalted rank and her menial occupation."

These mental conflicts of the severer sort usually arise in connection with the great fundamental human instincts, especially with the social instincts. Freud has shown how largely the sex instinct is involved, and Hart has called attention to what he calls the herd instinct, or what would better be called the group instinct; and he cites Trotter (26, 27), who has made a study of the sociological significance of this instinct. Hart suggests that the fundamental mechanism which underlies the vast group of insanities where individuals show unsocial tendencies, indifference to the ordinary conventions of society, and the like, consists essentially in a repression of this instinct.

The significance of these pathological cases lies in the fact that the abnormal merely represents in large letters and lurid colors what occurs in case of normal individuals. In all of us there is the same interference of association, the same desire for unity in the mental life. The more cultivated the individual, the wider the interests and activities of the individual, the greater the number of occasions for conflict and interference of association, and, so far as such conflict does occur, the greater the strain upon the mental health. Modern studies in psychology and psychiatry show not only the helpful methods of re-education in case of the pathological, but they suggest certain important preventives of interference of association and the conflict and confusion in the manifold distracting situations of life. In general terms these may be formulated as follows:

1. *An absorbing aim.*—The predominance in consciousness of some absorbing aim gives unity and coherence to our thinking. This was the essential part of Plato's doctrine of the hygiene of the mind (12) as I understand it. There must be unity, harmony, and coherence in the stream of thought; and lack of coherence, conflict of ideas, signifies loss, waste, lack of health.

Modern psychiatry has established this doctrine of Plato's in a most striking manner. Freud's doctrine of hysteria, for example, is that this nervous disease is due to a shock causing a psychic lesion, usually some shock in early life resulting in a complex of associations divorced from the dominant personality. This does not fuse with the ordinary stream of thought and acts like a foreign body in consciousness. Extending Plato's doctrine we may say that anything in a man's past that he dare not face, acts as such a foreign body and is detrimental to the mental health. Thus unity and coherence in the general stream of thought is the first essential condition for avoiding interference; and a dominant purpose goes far toward giving this.

2. *Interest.*—The child following some spontaneous interest is seldom the victim of interference. It is when dawdling over the uninteresting that his thinking becomes disorderly; especially if there is a strong emotional stimulus there is little danger of interference.

Freud thinks that no one would make a slip in speaking in the audience of the Emperor, or in a serious declaration of love, or in the defense of one's honor and name, and in short, in all cases where one's whole self is absorbed.

3. *Movement.*—The nature of the human mind is such that for continued interest, continued change is necessary. This is best expressed, perhaps, by the word "movement." This can be brought about by change in the external stimuli or by change in the subjective factor, the apperception of the individual. Thus, no matter how monotonous the environment, the man of culture can have a sustained interest because the richness of his apperception makes it possible to study the same object from many different points of view. On the other hand, the uneducated man keeps his mind clear and sane, in the routine of a monotonous existence by following the simple rule, *to keep moving.*

This need of change is recognized in our daily occupations; and in our hours of leisure and recreation, we are intolerant of monotony. The first essential of interest in a book, for example, is that it have movement. In fact, it is this need for change that causes the interference when occupied with a monotonous task.

4. *Activity.*—Co-ordinated motor activity is an important means of developing orderly association in general. In the various forms of manual work, and the like, close attention and clearness of the mental processes are essential, and practice makes for orderly thinking. Beyond all this, however, one's occupation represents perhaps the most important complex of associations in one's personality. If one has been fortunate enough to choose an occupation along the line of one's capacity, this becomes a focus for clear thinking and an anchor of sanity.

5. *Perspective.*—Another preventive of interference is what may be called mental perspective. One who gives attention to big things and is satisfied with essentials is far less likely to be the victim of interference than one who has an ideal of perfection in details. On account of the limitations of human nature one who tries to attend to all details is certain to suffer from interference and likely to neglect essentials.

The genius of the great man consists largely in seeing big things clearly and ignoring details, as was illustrated in the remarkable character of the late J. P. Morgan.

6. *Good physical condition.*—The dependence of orderly association on good physical condition is a matter of everyday observation. In abnormal nervous conditions, interference is a common phenomenon. The mistakes in the school, Bönhof has noted, are largely correlated with fatigue. The child speaks and reads and writes relatively smoothly in the morning, but toward noon makes many errors. Bönhof says that he himself makes slips in language most frequently after a long and fatiguing walk or the like. When one doesn't feel well one has a tendency to speech errors. Alcohol has a similar effect as a rule. In the school, the increase of such errors is a clear sign of fatigue and strain, or sometimes of momentary lack of adjustment. When such errors become common, the need of rest is indicated, and the natural reaction of a hearty laugh is a good remedy.

PRACTICAL SUGGESTIONS

What is the practical significance of all this for education? Is the demand for habits of orderly association really important? When one reflects how much can be done for those actually suffering from mental disorder by re-education and by developing habits of orderly association, one is forced to believe that a vast deal can be done by education in the way of prevention of pathological mental habits. The method that is good for cure is better still for prevention.

This condition of mental health, namely, orderly association, involves a fundamental and far-reaching principle. It should be considered in all arrangements of programs and subjects, in all methods of instruction. In school instruction, as the writer has pointed out elsewhere, there are not only the primary direct results of the teaching and the learning, but also certain secondary results, certain incidental habits developed, certain peculiarities of thought, certain mental attitudes, tricks of association, and the like. Some of these *should* be considered as primary aims of instruction and training, but as they are incidental results of the work, or usually so regarded, we may call them secondary results. With these, hygiene is especially concerned, and among these are the peculiarities of association often developed by the methods used. If we can prevent the development of habits of disorderly association, we shall do much for the mental health of the individual; for interference of association is often the germ of worry and the beginning of fear.

The aim of education is to make the new fuse with the old and become part of one's personality. Education would be easy if we had only to make sure that pupils learned a certain number of things in an ordinarily accurate manner; but the question of education is much more than this. It means the development of habits of attending to the essential and of ignoring the unessential, of orderly association in regard to at least a part of the field of human thought and experience, and the assimilation of what is learned.

It is one of the paradoxes of education that in order to remember we must associate an idea with many other ideas, but the larger the number of associated ideas the greater the danger of error. The following illustration from my own experience is typical:

Before I learned German I had no trouble in spelling the word school. But the other day I wrote the word *Schule* for it. I was writing English. I had no intention of writing German; but I was in haste. I gave attention merely to the beginning of the word *Sch.* If I had not studied German, but had specialized in English, the rest of the word would have come out all right; for the movements involved in making *sch* would have been firmly and clearly associated with those involved in making *ool.* But now the combination *sch* is associated in two series as the initial letters; and this makes error possible. If, as we may infer, we have here a typical illustration of what occurs in all such cases, then one of the essential conditions of recollection is a cause of interference and error.

It is precisely this fact, namely, that the greater the number of associations the greater the liability to error and interference, that makes mental hygiene necessary. In case of the uneducated person there is usually perhaps relatively little interference of association, except in regard to emotionally exciting events, but for the student or the man of affairs whose work makes manifold associations necessary, mental hygiene as regards association becomes essential, and in the school it is of prime importance.

Frequently in our experience this interference of association is not clearly conscious unless we introspect carefully. Dr. Gamble (11, p. 196) in her study of memorising by the reconstruction method, gives interesting illustrations. She writes:

> "Proper names which have a certain arbitrariness and cannot be recalled by any process of logical memory, have sometimes a maddening fashion of slipping just beyond one's reach when most wanted, behavior which is probably due to the reciprocal inhibition of associations which run out from the ideas which ought to bring them

up. If one is asked, 'What did David say in his haste?' or 'What did Portia say about mercy?' one answers with mechanical glibness 'All men are liars' or 'The quality of mercy is not strained; it falleth like the gentle dew from Heaven'; but if one is asked '*Who* said in his haste, All men are liars?' or '*Who* said, The quality of mercy is not strained?' though one may answer promptly, 'David' or 'Portia,' yet the reproduction-reaction time will be a little longer, and one may be conscious of the swift mediation of other images—perhaps of an open Psalter or of a mediaeval court-room. One may even detect and suppress a conflicting association with the mercy-quotation; a New Testament scene or one or more of the Beatitudes may flash through one's mind, even when one seems to others scarcely to hesitate in giving the right answer. Now when proper names or syllables, which are still more senseless than proper names, are learned in order, no other association is likely to conflict with that which runs from the series-member to the idea of its number or place. On the "other hand, there are apt to be a number of conflicting associations with the association which runs from the number or place-on-the-list idea to the name or syllable, and even with the association which runs from one name or syllable to the next. For example, when one wishes to recall the name of the president who succeeded Andrew Jackson one's 'mind' may run feverishly about among the details of that gentleman's personal history or the actual consequences of his dictum 'To the victors belong the spoils' and may refuse—at least for the moment—to proceed along the straight line of the presidents."

The first guarantee of efficiency in recollection is the possession of habits of orderly association, and any method of learning is to be judged by considering its effect in producing or hindering such habits. Any method which loads the mind with unecessary material and that tends to develop a habit of attending to the unessential and of forming superficial or irrelevant associations is a distinctly bad one. Hence the danger connected with some of the mnemonic systems, the danger from pedantic methods of teaching, and from lack of perspective in learning. The waste of energy involved Watt (30) has well described as follows:

"A wrong association is very hard to eradicate. It introduces an element of competition into the working of the associations, and if a wrong association has become powerful enough to recall its word, the consequence will be that, in order to repress it, the correct association will have to be worked up to much beyond the strength necessary for the reproduction of its word, had no false and competing association been formed. To make the correct association compelling, it will have to be raised to that strength which will enable it to reproduce its word more quickly than the false association can reproduce its word. This means a great deal of useless and unnecessary labour."

The writer (5) has elsewhere attempted to show that time is necessary for the organization of impressions and associations. In cases of amnesia due to shock, or the like, where loss of memory extends only to a relatively short period preceding the cause of it, that is, in cases of so called retroactive amnesia, the amnesia may be due to the fact that the memory was never completely organized. In normal memory the process of organization is continually going on, and in order that ideas may become a part of the permanent memory, time must elapse for the organization or consolidation to be completed. Anything that interferes with this hinders acquisition.

Bergström and others have since found experimental evidence of this process of consolidation. Müller and Pilzecker, as already noted, found that in learning nonsense syllables less was retained if immediately after learning a series the observer was required to concentrate attention on some other task, and they assumed that the mental strain of the latter checked the consolidation process necessary for a permanent memory. This result strongly suggests also that interference of association occurred due to the task requiring attention.

That interference of association is especially likely to occur in the first few minutes after anything has been learned seems to be most strikingly illustrated by these experiments of Müller and Pilzecker. After learning a series of nonsense syllables by the method of paired associates they gave the observer a task requiring concentration of attention a few seconds after the learning of the original series was completed. Again in another series the task requiring attention was given six minutes after the original series was learned. A test was made of what was retained an hour and a half afterwards, and it was found that of the first series only 28 per cent was remembered; of the second series 49 per cent. In the case of the latter the process of organization or consolidation of the original series had been largely completed. In the first series there was not time for organization before the distraction was given, hence less was remembered, probably largely on account of the greater interference of association.

The practical bearing of this is obvious on a moment's reflection. Haste in learning defeats its own end, and a short rest may be frequently distinctly more advantageous than continued work. It is especially necessary that suitable periods of rest should occur between the learning of disparate topics. In the schoolroom, for example, from purely pedagogical reasons, not to mention hygiene, it is usually wise to give a rest of five or ten minutes, at least, after one recitation or the study of one subject, before taking up a different one. The hurry from one topic to another in the ordinary class drill does not usually mean efficiency. Especially after the learning of a fact or principle of prime importance, a rest of a few minutes to give time for the organization of the memory may be a distinct advantage.

More recently Fräulein Heine (20) in G. E. Müller's laboratory has shown by experimental investigation that the mechanism of recognition and the mechanism of reproduction are different. Her experiments were in part as follows: The observers memorized nonsense material, then a distracting task was given, and after an interval a test was made, not of what was retained, but of what could be recognized. With the method of recognition there was no evidence of retroactive inhibition of the memory for the material learned. With the method of paired associates, the *Treffer-methode,* there was in all cases retroactive inhibition of the memory. This is a noteworthy result, and, although distinctly in conflict with what has been supposed to be the fact by some psychologists, seems to be well established by Heine's experiments. How shall we account for this? The obvious explanation seems to be that in case of the method of recognition there is no interference of association when the test of recognition is made; by any other method there is likely to be interference when the test is made. This is in agreement with general experience. We recognize hundreds of persons and things that we cannot recall by association, or recall with confusion.

The fact, which seems well established, that before the material learned has been thoroughly organized there is likely to be interference of association with all methods except the recognition method, and the further fact that when the new material has been thoroughly organized no interference is likely to occur, are distinctly significant for the hygiene and methodology of school work.

For a single illustration of the practical application of this principle take the methods of teaching any subject like a foreign language. In the early stages of learning, when error is certain to occur by the method of reproduction or the like, it is well to use largely the method of recognition. Familiarize the pupil with the different forms by showing them in the book and by repeating them; and do not attempt to have the pupil reproduce them until a considerable familiarity has been acquired. After a good degree of organization of the new forms has been gained, then a more effective method is the method of voluntary reproduction. Wherever in fact the method of reproduction can be used without error it is distinctly better, but where error or interference of association is likely to occur, the method of recognition is better.

To illustrate more in detail the way the principles of instruction should be studied from the point of view of mental hygiene as well as from that of pedagogy in the narrower sense, take the subject of correlation. Few subjects have attracted the attention of teachers more than this during the past thirty years. Wherever teachers have gathered, and wherever educational periodicals have been read, the means of properly correlating the different subjects of instruction have been considered. But the problem of correlation is one of hygiene as well as of pedagogy. Many different subjects demand a place in the curriculum. It seems necessary that several branches should be pursued simultaneously. These subjects, however, must not be taught in a haphazard manner without relation to each other. Without correlation the numerous subjects of the modern programme are likely to cause confusion and over-pressure.

How may different subjects be taught simultaneously without confusion? One method is isolation. Dr. Harris has this in mind when he says in the Report of the Committee of Fifteen: " Your Committee would call attention in this connection to the importance of the pedagogical principle of analysis and isolation as preceding synthesis and correlation. There should be rigid isolation of the elements of each branch for the purpose of getting a clear conception of what is individual and peculiar in a special province of learning."

On the other hand, correlation is an important means of avoiding confusion. The demands of hygiene in regard to correlation result directly from the psychology of memory and association. To appreciate their significance we may again take illustrations from the psychology of memory.

Ebbinghaus (8) in his classic experiments upon memory found that after learning a series of nonsense syllables, although the memory of it was so evanescent that after twenty minutes he was unable to recall the series, still certain traces persisted unconsciously, so that even after a month the same series could be re-learned in less time than was required for a new one. We notice the same in ordinary experience. A forgotten poem or lesson is relearned more easily than an altogether new one. These unconsciously persisting elements we may suppose are entirely physical. They are simply the traces of neural habit; yet they are potentially related to consciousness, and are important.

Further the experiments by Bergström (3) have shown that such unconscious traces or rudimentary habits of association not only aid in re-learning an old series of associations; but that under certain conditions they hinder the acquisition of a new series. In one series of experiments Dr. Bergström tested distinction and choice times by having the subject of his experiments sort ordinary playing cards. Eighty cards were used in a pack, and there were ten kinds of cards, each marked by an abstract word printed at the top. The observer sorted these cards as rapidly as possible into ten piles corresponding to the ten kinds of cards, chance determining the order of the piles. Each experiment consisted in sorting two packs containing the same words into different piles. For example, one of the ten groups of cards, we will say, had the word *suggestion* printed at the top. In the first half of the experiment these cards perhaps were placed at the right, in the second half, in front of the observer. Another group was placed at the left perhaps at first, and at the right in the second half of the experiment, and so on. It was found that in sorting the second pack the time was longer and the observer seemed confused, showing a tendency to place the cards in the positions they had had in the first half of the experiment. Two different reactions were associated with the same sensory stimulus and interference resulted. Bergström's results do not, perhaps, show quite clearly how far the delay was due to these unconsciously persisting traces. But they do show, apparently, that during the process of acquiring such a series of associations, interference is likely to occur if different series are learned one after the other in immediate succession.

Experiments by other investigators indicate the same. On the other hand, experiments by Münsterberg in replacing old and well-organized habits—like the dipping of a pen in ink, the putting one's watch in a given pocket, and the like,—by new ones, showed that after the new series of motor associations was thoroughly learned, either the old or the new could function automatically with little interference from the other, i. e., there was no confusion.

The following will serve as an illustration: Dr. Münsterberg had an extended piece of work which required him to sit at his desk writing many hours each day. His custom, like that of most writers, was to dip his pen in an ink bottle placed at the right of his manuscript. He tried the following experiment: Two opaque ink bottles of just the same size and shape were used, one was placed at the right of his manuscript, the other at the left. The bottle at the right was empty, the one at the left was filled with ink. As he wrote he automatically dipped his pen in the bottle at the right as usual, but getting no ink was reminded that he must try the bottle at the left. A record was made of every time the pen was dipped in the bottle at the right or a movement to do this was made. The result was substantially as follows: Twenty-five movements more or less to the right were made before the new habit of dipping the pen in the bottle at the left was fully established. Then the latter bottle was emptied, and the one at the right filled again. A number of movements towards the bottle at the left were made before the old habit of dipping the pen in the one at the right was re-established. Then the same experiment was repeated emptying the bottle at the right and filling again the one at the left. Some eight times the old movement of the hand towards the right was made before the new habit of dipping the pen in the bottle at the left was re-established. But the experiment was continued until, finally, the writer at will could change from one bottle to the other without making any false movements, that is, either habit could function automatically without interference from the other after a single initial impulse from the will.

These experiments supplement each other and they throw an important light upon the psychology of learning. The one series shows that there is likely to be interference of the incipient habits formed during a process of learning; the other indicates that after the paths of habit are well formed there is no interference. Of course, these experiments concern primarily the association of motor reactions with sensory stimuli; but the results are in harmony with those found in other experimental studies of memory, and illustrations from every-day experience might be given for other forms of association.

If, as we may suppose, we have here typical examples of what occurs in all psycho-physic associations, then a few pedagogical inferences seem legitimate.

It is clearly important in methods of instruction to avoid this interference of associations. Wherever a large number of subjects are crowded into the daily program, interference is liable to result. But it is necessary to have a number of subjects; for a child's attention cannot be kept long upon one thing. Interest soons flags. It is necessary both for psychological and hygienic, as well as for practical reasons, to have variety in the daily program. The psychology of association indicates the plan that is hygienic. Sometimes isolation is a means of avoiding interference, sometimes correlation.

The principle would seem to be as follows: When the similar mental processes involved in learning two subjects are the essential thing, and when the differentiae and details are unimportant, correlation or concentration is advantageous. It is itself a means of avoiding interference of association. Similar processes are repeated in the different subjects, and we get the advantages of repetition without destroying interest. Thus arithmetic and algebra may advantageously be studied together; for similar processes in the two subjects are the essential things, and the differentiae are relatively unimportant. When, on the contrary, the dissimilar processes and the details are essential, isolation is advisable. For example, if one is learning two similar languages, say Italian and Spanish, for the practical purpose of speaking them, it is well to study one until the associations are well organized before taking up the other; for here the slight differences are important and interference of association would be likely to result if the two were learned simultaneously. Recrudescent memories of Spanish sounds might interfere with articulation in the Italian class; and Italian forms would be likely to be confused with Spanish. Of course, if these languages were studied for some other purpose, say for a general philological purpose, the reverse might be true. Cognate forms would naturally be studied together. Thus where the dissimilar elements and processes are essential there should be isolation rather than correlation. For example, the correlation of arithmetic and religion, frequently attempted in the past, would seem to be unwise.

This principle concerns not merely the matter of correlation in the program; it should be regarded also in the more concrete questions of method.

A great many concrete educational problems come here. What is already known throws light upon some of them. Where two series are to be learned, several members of which are common, as h b c i f and h b e i l, should they be learned together or separately? The answer to this, as already pointed out, depends upon the purpose for which the two series are learned. If they are learned together, there should be a large number of repetitions to insure the permanency of correct associations. Usually it would seem to be better to study the two series separately at first until they are pretty firmly impressed upon the mind, because there is likely to be interference of association, if not actual error, when the two are studied simultaneously. Take a single concrete example; one of the chief difficulties in orthography is the spelling of homonyms and the like,—similar words, such as the verb *advise* and the noun *advice*—*council*, the name of a deliberative body, and the *counsel* of wise men to which we are supposed to listen. Many are here the victims of chronic interference of association. According to our formula, the spelling of such words should in the first instance be taught separately with many repetitions, not simultaneously as is often done; for here the differentiae are essential. Such a problem, however, must be solved by experiment. In this particular case the problem has been studied experimentally by Pearson (23); and while, it is true, his results indicated that fewer errors occur when homonyms are studied together, apparently he did not determine in how many cases the students tested by him had already mastered one member of the pairs studied; and recent experiments by Finkenbinder, not yet published, indicate that so far as experiment is concerned, this problem is at least still open.

So much for the hygienic aspects of correlation. I may be more or less right in the way I have formulated the practical principle stated; but the general principle is clear enough. The aim in correlation should be to avoid interference of association as much as possible. The hygienic importance of this is obvious when we recall that usually confusion is a form of worry.

Of course, careful thinkers often come to practically this same conclusion when they aim to correlate according to the natural relations of things; but the point to be emphasized is that the practical pedagogical problems of correlation and the like should be studied from the point of view of hygiene and the psychology of association as well as by the more strictly pedagogical method usually adopted. This would not only be of advantage hygienically, for avoiding confusion and worry, but it would also check the abuses of correlation that its most ardent advocates deprecate.

In the organization of the curriculum, the articulation of the grades, and the like, as well as in the concrete methods of instruction, this principle of orderly association should be regarded. As a matter of fact it has often been strangely ignored in the schools; but here and there an experiment has been tried by a method of concentration in accordance with sound principles. At Frankfurt, in Germany, for example, such a plan has been adopted for many years in the teaching of foreign languages in the secondary schools.

For example, in the Gymnasium in Frankfurt, French takes the place of Latin in Sexta, the first year of the course, and no other language is given for the first three years; thus the pupils concentrate on this language until its forms are pretty thoroughly organized. Then at the beginning of Unter-

Tertia, the fourth year of the course, when pupils are perhaps twelve years of age, the study of Latin is begun. French is continued; but with the thorough organization already acquired there is little danger of interference of association; and the larger part of the time is devoted to Latin, some five to ten hours a week. Then after two years more, when the Latin forms are thoroughly organized, i. e., at the beginning of Unter-Sekunda, when pupils are perhaps fourteen years of age, Greek is begun. Latin and French are continued; but their forms are so thoroughly organized that it is possible to take up a third language without much danger of interference.

Whenever new subjects are taken up it would seem wise that there should be concentration on a single subject for a sufficient length of time for thorough organization of the essential forms, and that related subjects should not be begun until the organization is sufficiently far advanced to hinder interference of association.

In all methods of learning the same principles should be remembered. In committing to memory, for example, the whole method is better than the part method, not only because the task is usually learned more quickly by the whole method, but also because with the whole method there is less occasion for interference of association. Thus in learning a stanza of poetry it is an advantage to learn it as a whole. With the ordinary method of learning by lines an interfering association is liable to be formed between the end of a line and the beginning of the same line.

In most errors, such as are made in the school room, there is interference of association. On the other hand, that errors are likely to cause interference of association has been shown by convincing evidence. Culler, for example, reports the results of his own experiments as follows:

> "The records as well as the introspections show that one error tends to cause another. This is what Book means when he speaks of 'bad associations,' 'bad tendencies' and 'interfering habits.' Errors are not grouped by mere chance, but an error makes an interfering association which is hard to overcome. The cause of the grouping of errors is due to these bad and interfering associations. Bosk finds that in some cases it takes a very long period of time for them to drop out, and that not until they do drop out can there be unimpeded progress. He cites the case of a music teacher who recommends that in learning to play a piano, it is better to practise in periods of 15 minutes with recesses, than to continue for an extended practise, because of the fact that interfering tendencies do come in and cause error. When these drop out again gain can be made without the strain and useless labor that would be expended in a long practise at the time. This accounts for the little improvement on some days and the smooth progress made on other days."

The desirability of helping pupils beforehand on the lesson of the following day is obvious. Right forms and correct methods can be emphasized and error avoided. In all forms of motor training, including reading and speaking, it is especially important to avoid error; and unless in the first instance the teacher goes over the lesson with the pupil, mistakes are almost sure to occur. In many schools it is the custom to give special drill at the end of the recitation on the work of the succeeding lesson, in order that the pupils may in their study by themselves drill on correct forms. In general the aim should be to avoid error rather than to correct it. In questioning there is special need of considering the formation of habits of orderly association. Ordinary methods of questioning are apt to lead to interference. A question is an association experiment under school conditions; an association experiment is a question under laboratory conditions. The child's association reaction-time is very much longer than that of an adult; hence, as Mr. Yamada (31) has shown, it is especially necessary to give time for children to answer; and, as Meumann has found, quick answers are apt to be senseless answers. Again the spontaneous report, the *Bericht,* is in most instances probably less likely to cause interference of association than ordinary questions, because a child has the opportunity in the *Bericht* to express dominant ideas first, and this often saves interference.

Again in the ordinary questioning of the classroom it is well to remember that where children are especially interested in one special point, as is often the case, it is wise to let them express themselves on the topic on which they are interested and get it off their minds wherever it is possible, otherwise interference of association is almost sure to occur. It is true that pupils should be trained to give attention to the present situation; but when they come into the schoolroom their interest in the previous present situation is often so great that until they have fully expressed themselves upon that it is impossible for them to concentrate on the new situation. By all means they should be trained to attention to the present, but a psychological method should be employed in developing such attention.

Recent studies, especially experimental investigations of the higher thought processes, have shown how important are the instructions given by the experimenter, in determining the attitude and associations of the observer. Under certain conditions, for example, positive instructions make for unity and clearness, negative instructions tend to produce interference of association. Geissler in his experiments found evidence "that a simple positive instruction sets up only one determining tendency, in accordance with which certain mental processes are neurally prepared for easier and quicker entry into consciousness as soon as the proper stimulus occurs; while a negative instruction sets up at least two determining tendencies, which either bring about a more or less conscious conflict of two mutually exclusive motor reactions, as in the attitudinal form of suppression, or prevent their ideational representations from issuing in motor discharge, and thus allow another neurally prepared process to lead to a reaction, as occurs in the ideational form of suppression."

Whenever students come to a recitation with a wrong attitude there is sure to be interference of association. Of course this may be an attitude of repugnance to the subject, or dissatisfaction with the method employed, or dislike of the teacher, or a critical attitude, or an attitude of indifference, or what not, but in any case it is likely to cause confusion. This is often seen even in the case of mature students. For a single concrete illustration, the writer has often seen students at the doctor's examination unable to answer some simple question because their attitude was one of adjustment to a very difficult situation, and expecting an extremely difficult question they were quite unable to apperceive and answer a very simple one.

At the ordinary school examination one finds many illustrations of interference of association. The necessity of finishing one's work in a given time, the importance of answering as well as possible, the fear of failure, and the like, all are liable to produce interference and confusion. The ordinary attitudes of the examination make interference almost inevitable, and the experience of many a student is similar to that reported by Mr. Yamada (31, p. 179), who says that in his own case a question at an examination or the like "causes a sudden arrest of psychic activity, or there arises out of unconscious complexes an apparently unrelated idea."

Finally, it should be remembered that the attention of children is not as easily adjusted to a new situation as that of adults. More time is required for them to turn attention from one thing to another. Until they are able to adjust attention to the new, interference is liable to occur, and both in discipline and in instruction allowance should be made for this slower process of adjustment in case of children.

Dr. Rosanoff and Miss Rosanoff (24) have made a study of association in children. The material consisted of 300 records of association tests made on as many school children between the ages of 4 and 15, the subjects being selected at random, although an equal number of each age were tested.

The results showed that the younger subjects gave a comparatively large proportion of doubtful and individual reactions and failures to react, with a corresponding reduction of common reactions. The authors conclude that the tendency of children to respond with individual reactions more often than adults were due largely to lack of mobility of attention, which results in an inability quickly to dismiss from the mind the previous stimulus or reaction words, and to turn the mind wholly toward the new stimulus.

These authors found also a definite correlation between association and mental capacity, and also between association and school grade. Extreme departures from the average at a given age they conclude are dependent on pathological variations in mental capacity, plus variations being characteristic of unusual precocity, minus variations bordering on the pathological.

In the school room the phenomena of interference of association are very common. They appear in a great variety of forms from mispronunciations and errors in motor adjustment, mistakes in spelling, and the like, up to the extreme forms of distraction and worry on the border line of the pathological. Bönhof (4), for example, has pointed out how frequently mispronunciations occur in the schoolroom. Not an hour, he says, passes without the teacher or pupil makes such mistakes. Almost everybody makes them; children and adults; cultured and uncultured; rural and urban children alike. The teacher can learn much from such phenomena; and on his part he can do much to eliminate them.

Thus in all methods and subjects the principles of orderly association should be considered. If there were time, concrete illustrations from the different school subjects could be given; this whole matter is really so fundamental in the hygiene of instruction that all methods of learning and of teaching should be judged by their value in producing orderly habits of association. And any method or device, or sequence of subjects, or the like, which is likely to cause interference of association is looked upon with suspicion from the point of view of mental hygiene.

If, perchance, these suggestions seem to the reader remote from practical hygiene, let him recall that interference of association, error, and confusion, usually mean the beginning of worry—the great enemy of mental health,—and that positive hygiene prefers the development of healthful habits of mental activity in the school to re-education in the sanitarium.

SUMMARY

1. Interference of association is inevitable on account of the fact that simultaneous stimuli of the nervous system may conflict and be more or less mutually inhibitory.

2. In highly organized individuals capable of mental work, interference should be exceptional and not continuous. It means great waste of energy, and when habitual is liable to be the cause of nervous disturbance.

3. It is of fundamental importance for the healthful development of the nervous system and for pedagogical efficiency to avoid interference of association as much as possible in all forms of school work, not only by methods of instruction and of learning, but also by the arrangement of programs and the like.

4. In arranging the program, the practical rule should be: Where the similar processes in two subjects are the essential ones, then correlation is advantageous. It is a means of avoiding interference of association. On the other hand, if the differentiae and details are the essential things, then isolation of the two subjects is advantageous as a means of avoiding interference of association.

5. Time must be given for the organization or consolidation of what has been learned. Interference of association is most likely to occur in the first few minutes after the acquisition. Thus it is of practical importance at the close of a period of study in one subject or after the learning of a specially important fact or principle to give a few minutes for rest. A recess of five or ten minutes may be more important for the fixing of what has been learned than continuous study. The constitution and character of the nervous system make the need of time for organization imperative. Haste defeats its own end.

6. The secondary results of school instruction referred to are of primary importance for hygiene; and many of the so-called secondary results are also of prime importance for pedagogy.

7. The development of habits of attention and orderly association is quite as important for the prevention, as re-education, for the cure of nervous and mental defects.

BIBLIOGRAPHY

1. AMIEL, H. F. Amiel's Journal. Translated by Mrs. Humphry Ward. London, 1891. 318 p.
2. BAIR, J. H. The Practise Curve. Columbia Univ. Contributions to Philosophy, Psychology, and Education. 1902, Vol. 5, 9.
3. BERGSTRÖM, J. A. Experiments upon physiological memory by means of the interference of associations. Am. Jour. of Psy., 1893, Vol. 5, pp. 356-369.
3a. —— ——. The relation of the interference to the practice effect of an association. Amer. Jour. of Psy., 1894, Vol. 6, pp. 433-442.
4. BÖNHOF, H. Versprechen. Pädagogisch-psychologische Studien. 1908-11, Vol. 11, p. 14.
5. BURNHAM, W. H. Retroactive Amnesia. Amer. Jour. of Psy. 1903, Vol. 14, pp. 118-132.
6. —— ——. Mental hygiene. Proc. Congress of Hygiene and Demography. Washington, Sept., 1912.
7. CULLER, A. J. Interference and adaptability. Archives of Psy. Columbia Contributions to Phil. and Psy. Vol. 21, No. 2. 80 p.
8. EBBINGHAUS, H. Ueber das Gedächtniss. Untersuchungen zur experimentellen Psychologie. Leipzig, 1885. 169 p.
9. FREUD, SIGMUND. Psychopathologie des Alltagslebens. Berlin, 1907. 132 p.
10. —— ——. Selected papers on hysteria and other psychoneuroses. Nervous and Mental Disease Monograph Series. 1909, N. Y., No. 4. 200 p.
11. GAMBLE, E. A. McC. A study in memorizing various materials by the reconstruction method. Psy. Rev. Mon. Supp., 1909, Vol. 10, No. 43. 210 p.
12. GOMPERZ, T. Greek thinkers; a history of ancient philosophy. London, 1901-12. 4 vols. Translated by G. G. Berry.
13. HARRIS, W. T. Report of the Committee of Fifteen. Proc. National Education Association. N. Y., 1895, pp. 287-343.
14. HART, BERNARD. The psychology of insanity. Cambridge, 1912. 176 p.
15. HIRSCHLAFF. Zur Psychologie und Hygiene des Denkens. Zeitschrift für die Neurologie und Psychiatrie. 1911, Vol. 6, pp. 214-241.
16. JANET, P. M. F. L'état mental des hysteriques. Paris, 1911. 708 p.
17. JUNG, K. The association method. Amer. Jour. of Psy. 1910, Vol. 21, pp. 219-269.
18. MACDOUGALL, R. The system of habits and the system of ideas. Psy. Rev. 1911, Vol. 18, pp. 324-335.
19. MITCHELL, S. W. Reversals if habitual motions, backward pronunciation of words, lip whispering of the insane, sudden failures of volition, repetition impulses. Jour. of Nerv. and Mental Diseases. 1903, Vol. 30, pp. 193-203.
20. MÜLLER, G. E. Ueber Wiedererkennen und rückwirkende Hemmung. Bericht über den V. Kongress für experimentelle Psychologie. Berlin, 1912, pp. 216-222.
21. —— and F. SCHUMANN. Experimentellen Beiträge zur Untersuchung des Gedächtnisses. Zeit. f. Psy. und Phys. der Sinnesorgane, 1893, Vol. 6, pp. 81-190; 259-339.
22. MÜNSTERBERG, H. Gedächtnisstudien. In his Beiträge zur experimentellen Psychologie. Freiburg, 1892. 4 vols.
23. PEARSON, H. C. The scientific study of spelling. Jour. of Ed. Psy., 1911, Vol. 2, pp. 241-252.

24. Rosanoff, I. R. and A. J. A study of association in children. Psy. Rev., 1913, Vol. 20, pp. 43-89.
25. Ruttman, W. J. Zur Psychologie der infantilen Dissoziabilität. Zeit. f. päd. Psy., 1910, Vol. 11, pp. 252-271; 289-306; 337-349.
26. Trotter, W. The herd instinct and its bearing on the psychology of civilised man. Sociological Review, 1908, Vol. 1, pp. 227-248.
27. —— ——. Sociological applications of the psychology of herd instinct. Sociological Review, 1909, Vol. 2, pp. 36-54.
28. Verworn, M. Die cellular physiologie Grundlage des Gedächtnisses. Zeit. f. allgemeine Physiologie, 1907, Vol. 6, pp. 119-139.
29. Walton, G. L. Why worry? Philadelphia, 1908. 275 p.
30. Watt, H. J. The economy and training of memory. London, Arnold, 1909. 128 p.
31. Yamada, S. A study of questioning. Ped. Sem., 1913, Vol. 20, pp. 129-186.

PHYSICAL TRAINING IN THE NORMAL SCHOOL

By Henry S. Curtis

A normal school is a place of training in the art of teaching. The subjects that are required there are supposed to be selected on the ground that they will be directly useful to the teacher later. This consideration, however, has not applied to the work in physical training. There has apparently been no attempt to select physical activities that the teacher could use with her students. In general in this country we have not required physical training in a systematic way until the high school or college is reached. This is the more remarkable as it is obviously the inversing of nature's method. The child is born a little animal. His first interests and achievements are almost entirely physical. The physical period is the period up to puberty. After that there is a great awakening of the intellectual and emotional nature. The child rises into his last inheritance of civilization. Never afterward is the child estimated among his peers so largely by his prowess as he is in the years up to twelve or thirteen, and this of course means that never at any other time is physical prowess so much desired or so interesting. The little child spends nearly all of the energy that he develops in motor activity. Witness the ceaseless running back and forth of the three-year-old or the child of five. In my own studies of the activity of children at Clark University, using American pedometers, I found that where the daily activity of the school children was only eight and five-sixth miles, the activity of the children from three to six years of age was nine and two-fifths miles, showing about a half a mile greater activity on the part of the little children. Again, while the average activity of the school children was only eight and five-sixths miles, their activity on Saturday was ten and a half miles, showing again how much the school was repressing their normal activity. The little children who did not like to go to school usually gave as the reason, because "they had to sit still." Repeated tests showed that the little children less than six years old could not sit entirely still for more than thirty seconds; that when they were required to sit still for a considerable time, they became restless and irritable. This restlessness is only the outward expression of the high nervous pressure that comes from motor energy unused. The association fibers in the child's brain are poorly developed, he has to use the energy of each motor area largely in its own particular muscles, which can only mean that to avoid restlessness the small child must use all his muscles frequently. It is needless to say that this everywhere agrees with common experience.

Everything seems to say that the time for physical training is in the elementary school. It is then that there is the greatest interest in physical achievement. Health and life itself are dependent upon establishing a strong physique at that time. Physical development in childhood builds the foundations on which all later achievements must be erected. If the child is anemic and puny, he is likely to be carried off by sickness. He can not stand the worries and labors of school life. As soon as puberty comes the girl puts on her long dress, and her physical activity is greatly limited thereby and by the periods of disability that come with it. She must get most of her physical training, if it is to be really a general training, before this period. In the days of Pericles, the boy up to fourteen years of age went to the playground in the morning, and to the school in the afternoon. In Germany to-day there are three hours of physical training a week in all grades of the elementary school. In the English schools that prepare for the public schools, such as Eaton and Rugby, there are about fifteen hours a week. In contrast to this we have scarcely any in the elementary schools of this country. There is, however, a strong movement in this direction at present. State requirements are being established, and curriculums of games are being introduced. The time to train along any line is surely the time of greatest interest in this activity and the ripening of the faculty which controls it. The intellectual development of the race has followed its physical development. The physical is the first side of the individual to come to maturity. All of these arrows indicate that physical training should in general precede intellectual training, and should be completed long before the intellectual training can be finished. The physical training of the child begins in the spontaneous movements even before birth. The baby lies upon his back, and kicks up his heels, and waves his fists in such a way as to give almost ideal development to the muscles of the arms, legs, and back. The child of two or three finds in running and walking and climbing constant use for every muscle. In pioneer days this training was naturally continued by the hunting, and the fishing, the felling of trees, and the other activities of the frontier. To-day for the great majority of children these activities have ceased. The daily life no longer furnishes the necessary exercise, and the school must do it.

If this standpoint be true, and physical not intellectual training is the paramount need of little children, then it follows that the physical training of the normal school must be normal training, the same as in other subjects presented there; that the teacher must not come to the school prepared to give a certain quota of information alone, but she must be a good physical type, able to do the physical stunts as well as the mental ones. We must get away from the ideal of the teacher as a lean ascetic poring over some dusty volume in the small hours of the night, and see in its place the healthy, robust, wholesome man or women, with large sympathies and large acquaintance with life, who comes to live with the children for a season. His main business is not to teach arithmetic or geography, but rather to train individuals on every side of their nature. He will teach arithmetic, but he will also teach baseball. He will see that the relationships of the children to each other and the spirit of helpfulness and friendliness which they develop are quite as important as anything that he can teach them, and he will not seek so to monopolize the child's time with the set subjects of the curriculum that there will be no time to be a child and gain the experience of a child. If the normal school is to make its physical training also normal training, then it must obviously select physical activities that can be carried from the normal into the public schools.

Gymnastics.—To most people physical training means gymnastics and a gymnasium, but it must be seen at once that no system of training that requires a gymnasium or an expensive equipment to carry it on can be either normal or a practical training for our schools at present, for the reason that far less than one per cent of them are provided with gymnasiums, and the teachers can not carry a gymnasium about with them. There probably is not more than one per cent of the normal students for whom heavy gymnastics may offer real normal training. Light gymnastics with wands, Indian clubs, and dumb-bells, are more practical in that there are far more schools provided with these facilities than have gymnasiums. But it must be said of these exercises in general, that they do not give fresh air, and that they offer very little if any mental relaxation or recreation. Calisthenics can be carried into any school, as no apparatus is needed, but the same criticisms hold true of them as of the light gymnastics. In general practice also they are given in a listless, spiritless way that means neither physical training, fresh air, or recreation.

Athletics.—Athletics as they exist at present in our normal schools make no better showing. The whole tendency in athletic reform is to provide athletics for the student body and get away from the intercollegiate type of sport. Yet most or at least many of our normal schools have no other sort of athletics, and the whole effort apparently is to get a winning team that can scoop any other school in the neighborhood. I doubt if a normal school should have any competitive athletics at all. Certainly such practice is not normal training, and it tends to perpetuate athletics of this type in the schools of the country. As physical training for the student body, it may be disregarded, because it reaches so few. The only athletics pursued by the girls in most normal schools is tennis and a little basket ball and hockey. While the young women probably constitute four-fifths of the students, the entire athletic field is usually given over to the young men and competitive sports, and the young women have to play in such space as they can find.

General Athletics.—Athletics in this country have been subject to two general criticisms. They have reached only a small per cent of the student body, and in general the strongest and best developed part of it, who had the least need of the training; and second, there have been no standards. The A. A. U. has had almost absolute control of our athletics, and under the guise of promoting amateur athletics has been interested only in the specialist in sport, who has been practically a professional whether he has been paid for it or not. It has not been interested in general educational athletics for the student body. The sort of sportsmanship and courtesy that has been shown at our great college games often has been a denial of all the social and moral standards of our civilization. The movement for reform in athletics has also two essential directions. Seeing in athletics a valuable physical, social, and mental training, it demands that it should be provided for all, and that it should be recognized as one of the great educational forces of the country. The reformers are unwilling to let our standards be set entirely by the sellers of athletic goods or by semi-illiterate coaches who are hired to win games.

Dr. Luther Gulick has probably done more to reform athletics in this country than any other one man through two methods which he introduced into the public school system of New York, and has since promoted about the country.

The first was the forming of the Public School League of New York City, which is similar to the Schools Athletic League of London, but was probably a new invention with Dr. Gulick. The essential contribution of this League has been the introduction of a non-competitive standard test, which sets boys to competing not against each other but against a standard accomplishment which any well developed boy should be able to perform. In competitive athletics, children soon learn their relative place. It becomes perfectly certain that Johnnie Jones can beat everybody else in the hundred yards, and consequently no one else cares to run. Competition amongst individuals tends to the selection of a few winners, toward the specialization of the most capable. This is not the kind of training that the school should give. The small child needs not specialization but general training; and all, not a few, should get the benefits. The Public School Athletic League issues a handbook which sells for ten cents and contains its standards. The secretaries of this league are paid by the Board of Education in New York City. There are about a hundred other cities that have taken up these standards adopted by New York City. The common standard is that the boy under thirteen shall be able to run the sixty-yard dash in eight and three-fifths seconds; jump five feet nine inches standing; and chin a bar four times. These tests have two great advantages, that they get a large number of pupils into training, and that they set a standard of accomplishment. At the time we first tried this test in the Washington playgrounds, we found that there were none of the children able to do the three things; but after four summers of organized play, over five hundred children did the three things. Children always tend to come up to a standard. These tests do not require much room. If there is not room in the school yard, the children can run the sixty-yard dash in the street. This offers practical athletics for all schools whether city schools or country schools. All normal students should have some practise in trying or at least seeing these tests. They may be difficult for women students in a normal school, but if boys are to be taught by women, the women must have some of the accomplishments of the other sex as well. At least they should understand what these accomplishments are and how they are acquired.

Class Athletics.—The other form of athletics promoted by Dr. Gulick which is suited for use, is the type which is known as class athletics. Class athletics were invented by Dr. Ballard, assistant director of physical training for New

York City. In class athletics the class competes as a unit and the average record of the members of the class constitutes its record. At least eighty per cent of the class must compete. As the class record is largely determined by the accomplishment of its weaker members, this sets all the class to train these weak ones. The competitions are usually in the same event as the standard test. In some ways it is simpler in practice than the individual test, as the record of forty boys can be taken in a dash without a stop watch. If it takes the class five minutes and twenty seconds to run the distance, simple division by forty will show that the average time was eight seconds. The average records that some classes have made in this way are truly astonishing.

Relay Races.—There is an almost infinite variety of relay races, nearly all of which are interesting to children. Where there are a large number of children in the relay, this is one of the easiest ways to interest children in running, and the wildest enthusiasm is sure to result.

Folk Dancing.—There is a great new interest in folk dancing at present, also largely due to Dr. Gulick. The folk dances are the old racial dances that have been practised by peasant peoples in the market places or on the green for generations. They are nearly all vigorous, offering the best sort of physical training. They are done to music thus adding the charm of rhythm. They are too vigorous to be suggestive and leave the dancer too tired to concoct mischief. For the most part, the women dance with the women and the men with the men. They are one of the best antidotes we have for the dance hall with its well known evils. They are being introduced into the public schools quite generally about the country. In certain places there will be prejudice against them, because of the name, but there will be little if any prejudice arising from the exercise itself, and the prejudice is rapidly disappearing. The great obstacle in the way of their general introduction in the past has been the impossibility of securing suitable music. This has now been overcome through the Victrola machine and records, as a Victrola with ten records can be secured for a little over fifty dollars, which surely is not a prohibitive price for any school. Folk dances lend themselves peculiarly to festival occasions where they usually form one of the chief charms. These festivals are spreading to the small towns and the country, and the ability to get up an acceptable play festival will be sure to increase the popularity of the teacher in the community. Folk dances have the advantage of giving both physical exercise and grace. While they are ordinarily learned in a gymnasium and thus are not directly in the open air, they may be learned in the yard instead and are often practiced there. Folk dancing is especially adapted to the physical training of girls, from the fourth grade on; and all women students in the normal schools should be required to learn a few of the simplest ones.

Volley Ball.—In regard to games for older children, until very lately our schools have been facing almost unsurmountable difficulties. The school yards have been very small, and our national games have been baseball and football, both of which required very large grounds. The games and the yards could not come together. The renaissance of play has brought with it several new games that are suited to the space as the others were not. Among these games is, I should say, first and foremost, volley ball. Volley ball is a natural corrective of the stooped and rounded shoulders and the hollow chest of the class room. It ought to be required in the upper grades if for that reason alone. It demands very little space, as the ground is only fifty by twenty-five feet in size. The ball is soft and does not break the windows. The equipment is very inexpensive, costing not more than five or six dollars for the complete outfit. The game is played by girls as well as boys; but perhaps its greatest advantage is that children will begin to play it at nine or ten and continue to play it until they are sixty or seventy. It is peculiarly fitted for the rural school, because the boys may play with or against the girls, and it is often the only team game that there are enough of the older children to play. It is especially adapted for school use, because there may be any number of players on a side, and the class may take the game as a regular period of physical training. It is almost the only game that can do the work of corrective gymnastics. Every girl ought to play the game in order to get her head and shoulders back and stretch her chest out. Every country boy ought to play the game if it were only to cure his round shoulders and forward slanting head. Volley ball is being systematically introduced in a number of city school systems at the present time.

Indoor Baseball or Playground Ball.—Playground baseball is played with an indoor baseball on a thirty-five foot diamond. It is like regular baseball, except that the ball must be pitched underhanded, and the player is not allowed to steal bases. It is equally well adapted to the play of girls and boys. In Houston, Texas, I found there were from three to five teams among the girls in every school in the city. A diamond can be laid out in almost any school yard. It is a really practical game for the school and the city.

Long Ball.—Long ball is a variation of indoor baseball, but it is played with only one base, which corresponds to second base. The player is put out by a caught fly or by touching or striking him with the ball as he runs. There are no fouls, and any touch of the ball is a fair hit. There may be any number of players on a side. The game is very fast, because of the absence of fouls.

Basket Ball.—Basket ball is the game most commonly played at present in school yards by older children. Nevertheless it does not seem to me to be as well adapted to their needs as the games that I have mentioned. It is not played much by children before they are thirteen years of age. Girls and boys play by different rules, so that they can not play together. In the country schools there are seldom enough older girls or boys to play the game. Basket ball makes the most violent strain on the heart of any game that we know, because the playing is almost continuous. The strain is much greater than it is in football. If the game is to be played in the elementary schools where the pupils have not been examined, the halves should be not more than ten minutes. Basket ball has the element of personal encounter in it, which is apt to lead to rough play and quarrels. A class can not well be taken out to play basket ball, as there will always be a number who are not strong enough to play the game, and only ten players are required. This would make four grounds necessary to have a class of forty play as a regular exercise, and most school grounds do not have that much space, as the ground 35 x 70 is nearly twice as large as the volley ball ground.

Tether Ball.—Tether ball is well adapted to school yards. It is the most vigorous game that we have that can be played on a small space. A pole thirteen feet in length is set three feet in the ground. On the top of the pole is a tennis ball in a netting sack. A ring six feet in diameter is drawn around the pole, and a line twenty feet long bisects the pole and the ring. One player stands on the one side with a tennis racket and drives the ball around the pole as hard as he can, and his opponent drives it back again. The one who succeeds in winding up the ball around the pole above the black line will win the game.

Captain Ball and Emperor Ball and Newcomb.—These are games well adapted to school use also. They are games of lower organization and serve as a good introduction to the other games.

Tennis, Hockey, Baseball and Football.—Every young man ought to be able to play all of these games fairly well, and every young woman should be able to play the first two at least. Nevertheless they can not be properly normal subjects, because there is not room for them on the school yards ordinarily.

Class Room Games.—There have grown up during the last few years a series of games suitable for any classroom. These may be played in place of having recess on a rainy or disagreeable day or to liven up the class whenever it gets dull. They are carried on between the desks or over them and are practical for any school. If the windows are thrown open during the period, such games may meet the requirements of exercise, recreation and fresh air. Such games are just as truly normal subjects as arithmetic.

Games for Little Children in the Yard.—By these I mean the current games for little children, such as can be found in Miss Bancroft's book of Games or in Johnson's "Education by Plays and Games." These games the teacher may everywhere use voluntarily, at present, and they are therefore directly practical. But a normal school should be prophetic. It is training not for to-day or to-morrow, but the students of to-day must be trained along the line of educational progress and fitted to lead the movement. They should be prepared for conditions which are to prevail five or ten years hence. All the indications seem to show that the time is not far hence when we shall require the teachers to organize the play of the children. This has already come in Germany and Denmark and England, and I know not what other countries. Most of our progressive cities now have organized recesses for the younger children, and in a considerable number of cities, games are being introduced into the curriculum, and are taking certain periods previously devoted to class work. Even if games are not required, the teacher ought to play with the children in order to get in sympathetic touch with them and be able to understand them.

Physical Training in the Elementary School.—I am inclined to think that inasmuch as the early days of life are the physical period, that not less than half of the time of the lower grades and perhaps of the entire elementary school years should be given to physical training, and that this amount should be decreased gradually as we go up into the high school and college. That the time for the majority of the physical trainng is in the elementary school period, seems to be scarcely open to dispute. But play is also the life of the child, in which he is forming most of his habits and gaining nearly all his experience. There is a large mass of facts that seem to indicate that the elementary children would make quite as good progress in their studies if a half of their present school hours were devoted to play, and they would be acquiring at the same time other forms of training that would be worth quite as much to them.

Rules for Games.—Anyone who will study the athletic guide for any of our games will soon be convinced that these rules were intended for professional players and not for children. The rules presuppose the professional umpire and the grandstand full of spectators. In Germany the Association for the Promotion of Folk and Child Play has issued several hundred thousands of books of rules for the common games of the children. It seems to me little less than a national disgrace that we have left the athletic supply houses to make the rules of our children's games. These rules are too complicated in the first place, so that school children can not understand them. In the second place they are not designed in general to secure social and educational results but a spectacle. Is it anything less than a scandal for instance that the only book of rules that we have for volley ball, makes it one of the conditions of playing the game that " The Spalding Official Ball shall be used." One can but ask himself: Do our American games belong to the supply houses?

Will the Games and Dances Give Physical Development?—People are not accustomed to think of games as a system of physical training, and most people would be inclined to question whether or not it would be possible to secure adequate physical development in that way. Games will not certainly produce the type of the Farnese Hercules, but they may well create the type of the Apollo Belvidere. They will develop a strong heart and lungs and a stable nervous system; they will produce strength of legs and body muscles; but they probably will not secure to any large degree strength of arms. The child uses constantly in his play nearly every muscle in his body; and if these games are only interesting enough and are carried on for a long enough time each day to lead to a maximum of effort, they furnish almost ideal muscular exercise. Gymnastics seldom reach all the muscles in the same way that the child uses them in his play.

MENTAL DIFFERENCES BETWEEN THE SEXES.

One of the most extensive and well organized series of experiments for the exclusive purpose of discovering whether there are mental sex differences and what their nature may be, is reported in the June and December numbers of the *Journal of Experimental Pedagogy* for 1912. In this somewhat lengthy article of forty-seven pages, the authors, Burt and Moore, have ably correlated their results with those of other investigators in the same field. The introduction of well-planned graphs serves forcibly to illustrate the points involved. Whatever conclusions one may draw from the experiments, one can not but wish for more of the same character and quality, in this and kindred lines.

Perhaps the most popular way of comparing sex differences is by contrasting conspicuous characters in particular lines. For example, Ellis says of the 1,030 persons of eminence in British history but 55 are women. Cattell, out of the 1,000 most prominent persons in the history of the world, finds but 32 women, and these prominent because of beauty or birth. There are said to be nearly twice as many men as women in the asylums for idiots and imbeciles. Any conclusions from such data, as the authors have most forcibly shown by well plotted graphs, can have but little significance. The extreme is no indication of the mean. For the general tendencies of the two groups may run practically parallel.

The chief theories for sex difference have been biological, and the distinction of sex has been largely with reference to reproduction. The authors think that conjugation seems necessary for the perpetuation of the species, but it should be said the experiments of Woodruff contradict this assumption. Those qualities connected with reproduction are called primary, all others, such as height, voice, strength and, it is generally thought, mind, are called secondary. The ultimate origin of the latter is a matter of much controversy. The explanations may be grouped in five sets of theories of which the key words are,—selection, development, constitution, environment, transmission.

Of the first, Darwin has given probably the best and most complete discussion. This group of theories, however, fails to explain why the secondary characters of each sex are transmitted to each particular sex,—why they do not blend in equal proportion.

The developmental theories claim that the inequality of the development of the primary qualities produces the large secondary sex-differences. Spencer calls woman " an arrested man " and says she " remains more of a child and something of a savage." This being true, our education should be entirely different for the sexes.

Advocates of the constitutional theories tell us that the sexes are the natural antithesis but necessary correlatives of each other. This difference pervades the whole organism. The spermatazoon is small, active, katabolic, while the ovum is large, inert and anabolic: the male is usually smaller, more active, enterprising and prodigal in structure; the female is larger, passive, submissive and economical. Man therefore, is progressive, egotistic, self-regarding, rational, inventive, while woman is conservative, altruistic, species-regarding, emotional, and receptive. Then our education of the sexes should be entirely separate.

In regard to environment, "the outcome of this study" (an investigation into the mental differences of the sexes), says Helen B. Thompson in her excellent work, "is that the psychological differences of sex seem to be largely due to differences in the social influences brought to bear on the developing individual from early infancy to adult years." Such is the position of the environmentalists.

Of the transmission theories little need be said; for the preponderance of biological evidence is against the idea of acquired characteristics.

In the determination of mental sex differences, the authors think the following are the crucial questions to be answered: Are the mental differences greater than the physical differences? Are the mental differences greater upon the higher levels of conscious life or not?

From the Junior Form at the Wallasey Higher Elementary School, at which the forms are based on age, 130 children, 67 boys and 63 girls, were used in the experiment. These children formed two comparable and homogeneous groups. They were from 12½ to 13½ years of age. This age was taken because younger children were not desirable for some of the tests, older children would be more differentiated by puberty, sex differences in degree of general development appear minimal, and the weight, actual and relative, is about the same. The tests were made between Feb. 1911 and March 1912. To offset the probable advantage of the girls at this age, some of the tests were applied to children from 9 to 10 years old. Most of the tests were also tried on adults.

The authors first tested sense-perception, or the simple perceptual processes, comparing their results with those obtained by Miss Thompson and those obtained from Aigburth and Oxford children.

In the "spatial thresholds," they found females nearly twice as acute as males. For pain proper, women appear more sensitive, but in ability to endure deep-seated pain or painful or unpleasant experiences, men excel. In the "muscle sense" men are more acute than women. Using Miss Thompson's data for taste and smell, women are found to excel men in ability to recognize the presence and nature of tastes and odors,—men are more acute in the discriminaton of the qualities of tastes and odors. Thus men are used for tea-tasting, wine-sampling, etc.; for this work depends upon a low relative threshold. In the discrimination of pitch and color, girls and women excel boys and men. In judging length of lines, area, brightness, recognition of dim light, and of spots according to size and distance, boys and men are superior.

From these data, the authors conclude that the "differences are of such a nature, and size so similar at different ages and in different groups, that it is impossible to explain them away as due merely to education or experience." They infer that these differences are innate in the sense organs or nervous structures. Yet they admit the evidence is inconclusive. From a study of the data presented, the writer sees no reason for concluding the differences are not traceable to education, environment, etc. Probably the color-blindness studies give us the most positive evidence of inherited differences.

In the simple motor processes, tests were made of tapping, dealing cards, simple reaction time to sound and light. In these the boys were faster than the girls, though the differences were small.

The simple perceptual and motor tests were made more complex by elaborating the processes of comparison which most of them involve, thus increasing the coefficient of intelligence. In the bisection, trisection, and proportioning of lines, the boys excel the girls. In the irregular dotting, card sorting, alphabet, writing, reading and counting for speed, the girls excel the boys. In the solution of mechanical puzzles, which Miss Thompson calls ingenuity tests, the boys excel the girls. It does not seem to the writer that the factors of interest, training and experience have been considered in these experiments.

In the scope of attention and the maintenance of attention, as tested by the McDougal spot pattern and iregular dotting tests, the boys and men were found superior to the girls and women. These data are in conformity with the mental pathology of the sexes. In the female we find the greater number of cases of "hysteria, of split consciousnes, dissociated personality and mental conflict."

The mirror and memory tests were used for the prime purpose of determining the ease with which *new associations* are formed. The results of the first were contradictory. In memory, the female is superior. This is true at all ages and in all of the tests used by the authors, and for this reason they consider this difference innate. For the teacher, it means that the girls "assimilate" more rapidly than the boys.

For testing the speed with which *old associations* were reproduced, the methods of free and restricted association were used. In both of these the males were superior.

An attempt was made to test the vividness of the imagery by two methods, the objective and the introspective. In the former a series of objects were shown, series of noises made, or movements made, the subject then writing as many as he remembered. In the introspective method, "the subjects were questioned, according to a prearranged order, as to the vividness with which they could imagine certain experiences and required to arrange them in a corresponding order." The girls seem greatly to excel the boys in visual imagery; the boys are superior in auditory and motor. From the introspections of the students, and adults, the authors infer that while differences of type of imagery play little part in purely intellectual processes, they may have some influence upon moral characteristics. Visualizers see their friends, their acts, as present. Non-visualizers found that out of sight means to forget, to be out of mind.

The reasoning processes were tested by the completion of argument, analogies, sentences, opposites and the correction of syllogisms. The sex differences were not quite three times the probable error and are therefore negligible. An American experiment performed with 757 children under Thorndike gives the same results. Cohn and Dieffenbacher find with one exception little difference in the sexes. This exception is the critical tendency of the boys, shown by the frequency with which their answers, especially the wrong ones, are given with reservations.

Believing that "Mental behavior is determined largely by emotional capacities," Burt and Moore think too little attention has hitherto been paid these qualities. Such tests as have been used have been mostly physical in their nature, and are open to the objection that they do not make due allowance for the greater physiological activity of man. While the authors have used the pneumograph and sphygmograph and also the psychologalvanic reflex, the last with the best results, they find them unsatisfactory.

They attempt to study the emotional elements from their effect upon mental processes such as memory, attention, etc. Ambiguous words and pictures are given, from the selections and arrangements of which, it is learned that boys at an early age have greater interest in animals and things; girls, in persons. A little later, the boys prefer pictures of the opposite sex while girls desire the pictures of little children. Thus they find a particular mode of apperception and grouping for each sex. Using the continuous association tests of Jastrow, on children and adults, English, Hebrew and Chinese, they find women more subjective and personal in their tastes, men more objective and impersonal. Applying the discrete association tests, they find girls more emotional than boys. From questionnaires Dr. Heymans found woman "has stronger emotionality, greater activity, probably a stronger moral disposition and a greater tendency to secondary functions."

The nature of the emotions and objects arousing them differ at a very early age, and this difference under the influence of heredity and environment continues to increase, though it never equals the physical sex differences. So far as innate the emotions are rooted in the instincts connected with reproduction.

How then do the results of the data fit in with the various theories propounded?

In addition to the subjects mentioned, some of the tests were applied to 1,000 children and to adults of various social status and nationalities, with these general results; every test appears to differ with age, race and status; many of the sex-differences are the *same* in the various environments, ages and nationalities,—these are considered the most important and are assumed innate.

Such differences as have been found may be due to differences in nervous systems, neurones, synapses, or general structural differences. Such differences could be inherited. If, as in color-blindness, we may consider these sex-differences unit-characters, we could explain their limitation to one sex.

Physiological functions may by natural selection determine special characteristics through direct inheritance of those qualities most useful. Variation of the reproductive organs means variation in the development of the glands, pituitary, adrenal, thyroid,—this affects temperament. Woman's life contrasted with man's is largely visceral, man's, muscular.

Practically all of the tests demonstrate that the simpler the process, the greater the sex-difference,—the higher the correlation with intelligence the less the sex-difference. In very few cases, is degree of difference as great as is commonly accepted. The similarities seem about as frequent as the differences. Thus it seems to the writer that the authors have expressed, for the pedagogue, the gist of the whole matter in a quotation from Miss Thompson: "the question of the future development of the intellectual life of woman is one of social necessities and ideals, rather than of inborn psychological characteristics of sex."

George E. Jones

BOOK NOTES

"Till Teorien för Föreställningsforloppet" (contribution to the Theory of the Ideational Process), by G. A. Jaederholm, is a recent study, published in Swedish in the Scandinavian psychological journal, *Psyke* (Upsala, 1912, pp. 170-260). The article is largely historical and critical. It covers such topics as Wundtian "apperception," Ziehen's "constellation," "perseveration," the motor component in G. E. Müller's memory experiments, James' criticism of the individuality of *Vorstellungen,* Binet's description of thought, von Kries' contribution to the theory of *Einstellungen,* the thought-psychology of the Würzburg school, Jung's *Tatbestandsdiagnostik* and its critics, and Freud's theories of the functions of emotional complexes, concluding with a criticism of the Freudian theories. The author's position is thus stated in his own words: "Psychoanalysis is the beginning of a method for the investigation of egocentrically oriented ideas, which undoubtedly can become extremely fruitful for the normal differential psychology. But many of the far-reaching phantasies in interpretation, to which it has given rise, are helplessly uncritical and cry for the purging fires of normal psychology. What may remain after such a normal psychological control investigation no one at present knows." A good bibliography accompanies the paper.

In the above mentioned journal, the same author has a paper on the psychology of color perception ("Till Färgvarseblifningarnas Psykologi"), which is chiefly a consideration of David Katz' study, "Die Erscheinungsweise der Farben und ihre Beeinflussung durch die individuelle Erfahrung" (*Zeitschrift f. Psychol. u. Physiol. der Sinnesorgane,* Ergänzungsband nr. 7, 1911). A. N. GILBERTSON

The current issue (May, 1913) of the *Svenskt Arkiv för Pedagogik* (edited by B. Hammer, professor of pedagogy in the University of Upsala) contains articles on "Character Building in the School," by L. Levander, dealing largely with experiments in pupil self-government; "The Interest in School Subjects among Gymnasium Studen," by J. O. Nordlund, comparing the results of previous studies with those of a recent investigation by the author; "A Contribution to the Psychology of Good Writing," by E. Westberg; "Standpoint and Methods of Pedagogical Researches Concerning Teaching," by H. Forsberg, in which the author holds that psychological researches under laboratory conditions should be supplemented by investigations of a purely pedagogical purpose, in the school and the home, and emphasizes the training in civic and vocational lines as of paramount importance; and lastly, a discussion on "Personal Initiative and Causality in History," by G. Setterberg K. Nordlund. The editor gives a resumé of William Stern's "Differentielle Psychologie."

A. N. GILBERTSON.

The Sleep of School Children: Its Distribution according to age, and its relation to physical and mental efficiency. Parts I, II and III. By LEWIS M. TERMAN and ADELINE HOCKING, M. A. *Journ. of Educa. Psychology,* March-April-May, 1913. pp. 138-282.

The author first deals with the distribution of sleep according to age, then its relations to intelligence, to school success and to nervous disorders, and lastly with the conditions of children's sleep. It constitutes a real addition to our knowledge of this subject.

The Psychology of Laughter. By BORIS SIDIS. New York, Appleton. 1913. pp. xii., 300.

The preface contains the following significant sentence: "All citations, however, from these two American writers (Bret Hart and Mark Twain) had to be dispensed with, because their publishers' permission could not be obtained."

The book itself contains 27 chapters and is essentially an original work. The author has made very little use of the literature on the subject of laughter but the book is very rich in well chosen selections.

Educational Dramatics: A handbook on the educational player method. By EMMA SHERIDAN FRY. New York, Moffat Yard & Co. pp. 69.

Mrs. Fry, as we understand her, has attempted to carry on the splendid work done years ago by Miss Hertz, and she here gives an interesting review of her method of treating dramatics. There are examples of the educational use of the dramatic instinct, public performances, and a chapter on the player and the part. Besides continuing the work of Miss Hertz, Mrs. Fry has established an institution for the training of candidates for the stage.

The Way to the Heart of the Pupil. By Dr. HERMAN WEIMER. Tr. by J. Remsen Bishop and Adolph Neiderpruem, with special author's preface for American readers. New York, Macmillan. 1913. pp. xii., 178.

This book found so enthusiastic a reception in the land of its origin that it is here presented in English. The assumption is that love and not fear is the method of education. Some critics have said that to carry out such a scheme as is here discussed every teacher must be a Pestallozi, others have thought the child was idealized. The topics stressed are, the power of love, the influence of personality, patience and confidence, the punishing power, school appearances, uniformity and individuality, school and home.

The World's History at a Glance from 800 *B. C. to* 1913 *A. D.* In synchronous form, together with abstracts of Bible history and Greek and Scandinavian Mythology, with comprehensive tables and biography, showing the rulers, statesmen, eminent personages, principal events, discoveries, inventions, etc., with dates thereof, and maps of various countries. Compiled and edited by JOSEPH F. HARRINGTON and assistants. Boston, The Ball Publishing Co. 1913. pp. 66.

This is an extremely convenient conspectus of universal history. We have quite a collection of such, but this impresses us as on the whole far and away the best thing of its kind, as indeed it ought to be, since it is the last; but others have been so good that this praise really means a great deal.

The Shattered Halo and other Stories About Schools. By C. W. BARDEEN. Syracuse, N. Y., C. W. Bardeen, 1913. pp. 250. Price $1.

This must be the eighth or tenth volume of stories about teachers, pupils and school-life by this author, whose simple but interesting tales go to the heart and present a very vivid picture of contemporary American education from the standpoint of a man who has been vitally connected with it for many years. The author of this note has read all Mr. Bardeen's stories and deems this the best of the series.

The New Education in Religion: With a curriculum in Jewish Studies. By HENRY BERKOWITZ, D. D. Philadelphia, The Jewish Chatauqua Soc., 1913. pp. 128.

Deuxième Étude sur la Mémoire Logique: La Reproduction Après Des Intervalles Temporels de Différentes Longueurs. MM. A. MICHOTTE & TH. PORTYCH. Louvain, Institut Superieur de Philosophie, 1913. pp. 363.

Vorlesungen zur Einführung in die Experimentelle Pädagogik und Ihre Psychologischen Grundlagen. VON ERNEST MEUMANN. Zweiter Band, mit 39 Figuren im Text und 1 Tafel. Zweite Umgearbeitete und Vermehrte Auflage. Leipzig, Von Wilhelm Engelmann, 1913. pp. XIV., 800. Price-Mk. 12.25.

Greek Lives from Plutarch. C. E. BYLES, B. A. (Theseus, Lycurgus, Aristides, Themistocles, Pericles, Alcibiades, Dion, Demosthenes, Alexander.) New York, Longmans, 1907. pp. 232.

A First Book of Composition for High Schools. By THOMAS H. RIGGS and ISABEL MCKINNEY. New York, Ginn & Co. pp. vii., 300. Price $.90.

Primary Artisan Education. By W. P. WELPTON, B. Sc. New York, Longmans, 1913. pp. xix., 252. Price $1.25 net.

Aesthetic Education. By CHARLES DEGARMO. Syracuse, C. W. Bardeen, 1913. pp. xi., 161.

China Revolutionized. By JOHN STUART THOMSON. Indianapolis, The Bobbs-Merrill Co., 1913. pp. 590.

Educational Psychology. Volume I: The Original Nature of Man. By EDWARD L. THORNDIKE. New York, Columbia University, 1913. pp. xii., 327.

Review will follow.

The Growth of Responsibility and Enlargement of Power of the City School Superintendent. By ARTHUR HENRY CHAMBERLAIN. Berkeley, Cal., University of California Publications. Vol. 3, No. 4. pp. 283-441. 1913.

The Factors that Influence the Sensitivity of the Retina to Color: A Quantitative Study and Methods of Standardizing. By GERTRUDE RAND, Ph.D. Princeton, N. J., The Psychological Monographs. The Psychological Review Co., 1913. pp. xi., 166.

NOTES

Report of the Polish Child Study Association for the year 1912.—In the course of the past year, scientific research on the development of children has been a prominent subject of discussion, not only in the Polish Society for Child Study, but also in other societies in Warsaw. The Society of Preparatory Teaching arranged a series of meetings principally devoted to the analysis of different phases of the mental activity of children. Dr. Ioteyko now of Brussels, but a Pole, lectured on "Pedology in Pictures" making use of a great many pictures to illustrate the method and results employed in child study. At the Warsaw Hygienic Association Dr. T. Javoszyuski discussed psychological research in schools and some results of his own studies. Dr. A. Cygielstreich presented at the Polish Psychological Association, his study on Children's Subconscious Creativeness. In one of the autumn numbers of "Education" Professor J. W. David discussed the term Pedology. In his opinion, this expression is unnecessary and he proposes to keep the terms chiefly used in America, England, France, etc., *i.e.,* Child Psychology or Experimental Psychology. Miss Szyc, in the October number of "The Philosophical Movement" tried to show the genesis of child study and its manifold terms.

The year 1912 was marked by a decided tendency to popularize systematic and solid study in this branch of psychology. In the University of Brussels Dr. Ioteyko established international pedagogical courses with a high scientific standard. At Cracovie (Galicia) at the second meeting of neurologists and psychologists Miss Szyc lectured on the verbal and grammatical peculiarities of children's language between the fourth and ninth years. Dr. Beaurarain (Porarin, Galicia) read on "The Symbol." This was almost exclusively on children's speech, comparing some of its peculiarities with similar ones in the speech of primitive peoples.

On February 11, 1912, a branch of the Polish Child Study Association was opened in Lodz. In the beginning of the school year 1912-1913, a questionnaire was sent to the members of the society for working out themes for the study of speech. It was decided that there was an urgent need of organizing a series of systematic lectures on child study, but in consequence of many hindrances this plan was put off until next year.

In the fall of the year 1912 Mr. T. A. Koziava established a new periodical "The Educational Review," and Professor H. Matzke (artist), a quarterly review, "Form and Color," which contains valuable contributions for the study of the aesthetic development of children.

At the meetings of the Child Study Association during 1911-12 the following papers were presented: Professor K. Appel, The Development of Children's Language with Reference to the Vocal Organs; Miss Szyc, Answers of Children from Four to Nine, to the question "What is this?" Jarvs' Experiments with an aesthesiometer on school children (Mr. Jarvs found a correlation between sensitiveness and intelligence. Intelligent children are more sensitive); Mrs. Heymans, Creative Powers of Children, (Mrs. Heymans presented her observations of a child with a poetical disposition during the years six to ten); H. Wavxzavska, Subconscious Creativeness of Children, an experimental study from the Warsaw Psychological Laboratory; (Postal cards served as material. Children were asked to describe them and eight days later to report this from memory. Comparison of the results showed most frequently that the second descriptions were full of particulars which had not been on the pictures); Dr. Sikorska, Studies on Physical Development of School Girls; Miss Szyc, New Ideas and Works in the Studies of Intelligence of Children. (A sketch of lectures by Stern, Meumann, reports of attempts by American psychologists to complete the Binet theory, and remarks on Polish works in this line); Mrs. Grudinska, The Money Sense of Children. (This work was based on Will Monroe's syllabus and is the result of over 800 answers from children of all parts of Poland); Mrs. Grudinska, Self Government. (Here the self government experiments in America were presented, including the George Jr. Republic in Freeville, Gill's experiments in the United States and Förster's movement in Switzerland); Miss Majevska, a Study on School Compositions. (All these compositions were quite spontaneous and came principally from children from elementary schools from seven to twelve of age); Mrs. Lubliner, Report of the Congress in Bern (treating the question of abnormal children. Dr. L. Wernic, New Methods of Medical Inspection of School Children); Mrs. Silber, Children and Pictures (a study of the Capacity of Aesthetic Judgment in Children (showing that it can be developed by training).

During 1912, the Committee for the Study of Speech Development held three meetings. The work of the Committee during the year was centered on the study of the language of children from seven to eighteen years.

The Committee for the study of the character development of children held three sessions chiefly devoted to the revision of two questionnaires.

The Committee for the Study of Children's Drawings. The object of studies on children's drawings sent in as an answer to the two questionnaires printed in 1907 and 1909 was to show the psychological and educational value of this work. Mrs. Grudinska undertook the work of arranging, tabulating and determining results. A large number of spontaneous drawings have been collected and will be completed during the year 1913. These consist in answers to the second questionnaire.

The Polish Child Study Society sends its deepest and warmest thanks to the editor of the PEDAGOGICAL SEMINARY for printing its report, to Dr. Louis N. Wilson, and Theodate L. Smith, Secretary of the Children's Institute, for their continual aid and kindness.

ANNA GRUDZINSKA

Svenskt Archiv för Pedagogik (Swedish Archive for Pedagogy) is a new quarterly journal published at Upsala, the first issue of which bears the date of October, 1912. It contains 120 pages. The price is 5 kronor (about $1.35) per annum.

The object of the journal is to be the organ for pedagogical research in Sweden. It will contain scientific studies in the various fields of pedagogy and related disciplines. Problems will be treated partly in original articles, partly in critical reviews of prominent pedagogical writings. There will be also reports of the more important activities and developments in pedagogy in various parts of the world.

The editor is Prof. Bertil Hammer, of the chair of pedagogy in the University of Upsala. The list of collaborators includes the names of over two score teachers and other workers in both the academic and the administrative branches of the Swedish educational system. Resumés of important articles will be given in German, French, or English, thus partially at least making the contributions accessible to the vast majority of students, to whom the Scandinavian languages are a sealed book. The contents of the first number and the announcements of forthcoming contributions promise well for the character and value of the journal. Students of education everywhere will welcome this new endeavor to advance the study of pedagogy on strictly scientific lines in a country which, together with its sister nations of the Scandinavian culture-group, Norway, Denmark and Finland, has long been an object of admiration by the whole world for its excellent system of public education.

In his introductory statement, the editor points to the fact that the new empirical pedagogy had its beginnings in "the practical America," with the work of Dr. G. Stanley Hall. "In the course of two decades," observes Prof. Hammer, "Stanley Hall has succeeded in making the empirical psychology and pedagogy subjects with secure homestead rights in the educational life of his vast native land." He expresses also the debt of the science to other American investigators, of whom he mentions Dewey, Earl Barnes, Monroe, Russell, Chamberlain, Cattell, Donaldson, Sanford and Scripture.

Of European authorities in this field he names as most prominent the late Alfred Binet in France and Ebbinghaus, Lay, Meumann and Stern, besides Wundt, to whom belongs the honor of having laid the foundations in experimental psychology.

The Finnish University of Helsingfors was the first institution in the North to establish a professorship in pedagogy, though at the time of its founding it does not seem to have had any connection with the new psychological science. In Sweden there are now chairs of pedagogy in both of the state universities (Upsala, 1908, and Lund, 1912). In Norway and Denmark, while there are no separate chairs in the national universities, the professors of philosophy and psychology, Aal in Christiania and Höffding and Lehmann in Copenhagen, have made valuable contributions of pedagogical significance.

The leading article in this number, on children's ideals, has already been reviewed in the PEDAGOGICAL SEMINARY.

ALBERT N. GILBERTSON

Reasons for Exploiting Metrical Literature in Schools.—The article in the December number of the PEDAGOGICAL SEMINARY by Mr. Webster on "Versemaking in Schools" lacks, in my opinion, an important direction to the teacher who would be glad to follow Mr. Webster's suggestion for the purpose of adding a legitimate interest to school exercises in literature. Also Mr. Webster disregarded if he did not fail to recognize an opportunity to rate at its true and generally overestimated value metrical literature as compared with prose. He quotes the efforts of pupils to construct metres but does not insist on a prime value of this exercise, showing the pupil through his own experience how impossible it is to say just what you mean with the exigencies of rhyme and metre. Such an exercise as he describes should not be given, I think, without some class discussion of the advantage of prose over poetry for adequate and exact communication. Otherwise this interesting exercise may confirm in habits of inexact thinking the pupil who is repeating race history in showing an aptitude for metre; for instance, if a pupil has put a psalm into metre, he should be asked if the morality of the psalms would be more or less authoritative if the author had used prose instead of poetry as his method of communication. One reason that the article interested me was that I was formerly connected with the Commercial Department of the Central High School, Springfield, a department which Mr. Webster now serves in the new High School of Commerce. I still have in my possession some notes made for a lesson plan when teaching Poe; in them I demonstrate the fact that rhythm is a racial instinct, and give as examples the responses of the Delphic Oracle, keeping time unconsciously to march music, and the historic "Eeeny meeny, mony, mi." I chose Poe as the author with whom to correlate this instruction because he explains at length his own tricks of composition, and is skillful in the use of metres. I remember that my class by making some original metres acquired considerable respect for Poe's ingenuity; also they learned to read poetry aloud better. This was tested soon after by the Indian names in "Hiawatha," which they found less troublesome than those classes had that had not studied Poe. I hope this exercise increased their respect for metrical ingenuity and lessened their adolescent emotion toward poetry. They were young enough to like poetry but they were old enough to be taught better. The result was, I think, quite different from that to be expected in accordance with Macaulay's definition of poetry, quoted by Mr. Webster; Macaulay claims that the rudest form of language is the most fit for poetry, which is particular rather than general. My pupils learned that poetry is highly artificial, has always been so. A modern instance is such a poet as Austin Dobson or Swinburne; but Macaulay might have quoted examples as illustrative. His statement that poetry deals with the particular rather than with the general is denied by the poet whom Mr. Webster quotes for testimony as to the poetic nature of boyhood: Wordsworth says: (Poetry)'s object is truth, not individual and local, but general and operative.

One of the subjects of the eminent German Professor Eucken when lecturing in this country was "The Philosophy of Goethe;" this included Goethe the poet. There are several accepted definitions of poetry from which instances will readily present themselves to prove that poetry may be general; it certainly must be so if Matthew Arnold was right in calling it "a criticism of life," and his is a definition in good use. It seems to me a good plan to use metrical exercises in schools for the sake of taking advantage of a natural inclination, and to prove the careful workmanship of standard poetry, also, to show the defects of metrical expression from the point of view of exact communication; and this is the direction needed by the teacher to whom Mr. Webster has in general addressed himself. Just as long as pedagogical adults despair of the boy that finds Milton indirect, the teacher will need to be reminded of the spurious nature of poetry. We do not help our case of claiming that literature is worthy of the pupil's consideration by forgetting such defects. A Yale instructor (H. S. Canby, "Education," Nov. 1908), says that poetry is "the expression of the highest thoughts of the race in their best form," and that is a common definition that I would refute. We certainly can't mean what we say when we say this. Or is it time for an investigation to find out how many English teachers do believe such nonsense? Surely the permutations and combinations of metrical syllables can not be entrusted with our highest thoughts and all of them! It is arithmetically impossible. Since legislation has attempted to improve spelling, it is not impossible that a language may be legalized to substitute in poetry words of convenient syllabic arrangement for our inconvenient forms. But at present sense must often be sacrificed to sound in poetry.

A general lack in Mr. Webster's paper seems to me that of failing to state accurately the value of this combination of words known as metre. Such an attitude as that of the Yale instructor seems to me dangerous. Prof. Robinson of Columbia in his book, "The New History" says that we teach the young to revere the past too much; we should exploit it for the benefit of the present. A similar need to exploit poetic literature seems to me important. As a matter of fact the poets may truly claim:

"—we are the movers and shakers
Of the world forever, it seems."

But it is a pity that they are; for as it can be made evident to any pupil, if not surmised by him, poets say what they have to, to meet the exigencies of poetry. It happens that they have said some very beautiful and useful things. Prose also may appeal to the aesthetic sense.

Teachers certainly do not wish to encourage the taste for inexact expression, though in the form of metre, to become permanently racial. Inexactness of human communication is one of the disadvantages thus far common to the race which it is trying to overcome.

Macaulay, whose definition of poetry forms the introduction to Mr. Webster's paper, is a writer whose form even in prose is superior to his matter, indeed dominates it, the most vicious quality of literature. Judged by the moral standard of human communication, all poetry is vicious. If the teaching of English is to make educative concessions to the pupil's unconventional and enlightening estimate of authors, a little exploiting of poets will be useful.

In a book on "The Enjoyment of Poetry" by Max Eastman, formerly associate in philosophy at Columbia I find this statement: "From . . . their standpoint, the standpoint of practical sagacity, the statement ascribed to Tolstoy that 'nothing was ever said in poetry which could not be better said in plain language' is entirely true. But from the standpoint of one who wishes to experience the intrinsic nature of a thing spoken of, it is entirely true that nothing was ever said in plain language which could not be better said in poetry." I think that Tolstoy's statement as originally meant is sound. Mr. Eastman believes that to enjoy poetry one should write it, as he does. I have tried that and still am prejudiced against most pedagogical attempts to cultivate an appreciation of poetry.

Lucy Heald

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THE PSYCHOLOGY OF UNCONVENTIONAL LANGUAGE*

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INTRODUCTION

The two important aspects of linguistic study are the historical (12a) and the psychological. The former owes its rise to philology, whose original interest was the interpretation of Classical literature. Out of this interest grew historical linguistics, which concerned itself with the genetic relationship of languages and revived the ancient philosophical problem of the origin of language. But however far into the remote past the investigation of linguistic remains was carried, it could not penetrate the past beyond a hypothetical ancestor of historical languages, and it was found impossible to determine how primitive man spoke, in absence of the chief witness. As the oldest language—remains that could ever be discovered could not be regarded as primitive and original, this end of the line of inquiry had to be abandoned and attention was turned to the immediate present as offering a surer basis for scientific research. The study of the language of races now living in primitive conditions seemed

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to offer a closer approach to the subject, but this is also to be regarded as unsatisfactory, for the original language of the lowest savages is also lost in antiquity. The child and its animal congener remain as the only means of approach to the problem of the origin and growth of speech. But now the problem is no longer one of historical linguistics. It must now be framed in terms of physiology and psychology. While the physiology and the psychology of language throw light on linguistic problems, there are no better means than those that the study of language affords to investigate certain comprehensive problems of psychology.

It is only since about the middle of the last century that a psychological method of linguistic study has been recognized. Steinthal's "Grammatik, Logik und Psychologie" (39) was the epoch-making work that gave psychology the place in linguistics that philosophy had formerly occupied. Among later writers it is recognized by Frederich Müller, in his "Grundrisz der Sprachwissenschaft" (21), published in 1876. Paul, in his "Prinzipien der Sprachgeschichte" (25), published ten years later, regards psychology as "die Vornehmste basis aller in einem höhere Sinne gefassten Culturwissenschaften." Although this work was named 'The Principles of Historical Linguistics,' Wundt affirms (39, p 6) "Nicht als Sprachgeschichte, was es nach der ganzen Anordnung und Behandlung des Stoffes weder sein kann noch sein will, sondern als Sprachpsychologie hat unzweifelhaft das Paul'sche Werk seinen Erfolg errungen und seinen Einfluss ausgeübt." To come down to more recent times, a notable contribution to the subject is that of van Ginneken (32), published in 1907. The best known of all the works on the subject, however, approaches it from the direction of social psychology—Wundt's "Die Sprache" (37) in two volumes, first edition published in 1900 and third in 1911.

When once language was recognized as a product of development that had pursued its way for unknown ages, that was above all arbitrary dictums and went on unchecked by fiat or decree, students became expositors rather than law-givers of style. There arose a new reverence for the facts and conditions of growth. Interest in these made the "best usage" a matter of only practical importance. And now how people do speak seems more interesting to students than how they ought to speak.

But of the studies in the psychology of language above referred to, all have been concerned only with the fixed and standard forms of language or with dialects that are related to some great literary language, except that Wundt makes a passing reference to the "Gaunersprache" in the first edition (37), while he devotes about a page of the third edition to "Slang" (37 Vol. 1, p. 617). They mostly represent attempts to explain the laws of language familiar to the student of linguistics and philology in terms of psychology.

For many years there has been a wide popular interest in the subject of slang and unconventional language generally, as indicated by the number of dictionaries of unconventional words and phrases that have been published. Besides, there have appeared numerous essays on the subject. Among the more important collections of unconventional terms are those cited in the reference list appended to this study. Much of the popular interest in the subject has in the past been due to the question of the relation of slang to the purity of the English language. Again and again a determined stand has been made against the supposed corrupting influences of slang. On the other hand, it would be easy to collect an anthology in praise of slang. The philological tradition from Bopp and Pott to Whitney and March has been tolerant of change through the unconventional, and the list of those who, either by precept or example or both, have been favorably disposed to the use of popular speech, contains such names as DeQuincey, Noah Webster, John Hay, Burns, Lowell, Howells, Bret Harte, Balzac, and many others whose names will readily occur to the reader. It is Lowell's view (40) that "only from its roots in the living generations of men can a language be re-enforced with fresh vigor for its needs; what may be called a literate dialect grows ever more and more pedantic and foreign, till it becomes at last as unfitting a vehicle for living thought as monkish Latin." "True vigor and hardiness of phrase do not pass from page to page, but from man to man."

In the psychology of language in general very little has been done in English; in the psychology of slang nothing at all has come to the attention of the writer. The work that has been done in Germany in compiling dialect and slang dictionaries is inspired mostly by an interest in ulterior purely linguistic problems. In France where the activity in this field is greater than in any other country, there were, at first, besides numerous dictionaries, studies with purely linguistic aims. The prefaces to the French dictionaries of argot bring us closer to the heart of our problem. In his "Dictionaire de la Langue Verte," Hector France tells us that argot is found wherever two classes exist in society. It has outgrown associations limited to thieves, for each profession has its argot which it employs not only to be unintelligible to the layman but to render its phrase picturesque, to give it a variegated appearance of strangeness. But argot has long since invaded all the realms of society, and now *il prend partout droit de cite.* Delavan in his "Dictionaire de langue verte" (1883) says: "In France one speaks perhaps French, but in Paris one speaks argot, and an argot which varies from one quarter of the city to another, from one street to another, from one class of people to another. It is in the city that new words are fabricated. Paris sets the style for words as it does for hats."

Besides these popular essays and philological studies of slang, there are two works in French which have approached more closely than any others to the psychological interest of the present study. An article by Raoul de la Grasserie in (14) Revue Philosophique, "La Psychologie de l'Argot," was followed by a volume, of one hundred and eighty-five pages, in the Bibliotheque de Linguistique, on the "Etude Scientifique sur L'Argot et Le Parler Populaire," by the same author (13). In the first article, the writer calls attention to the importance of the psychological study of argot and attempts, as he says, to sketch such a study in its chief outlines. The work which followed carries out the suggestions of the preliminary study, so that the two studies may be regarded as one and the same. The larger work did not become accessible to the writer of the present study until after the material for the study had been collected and the plan of treatment decided upon. The only other work on the subject known to the writer is "Le Génie de L'Argot" by Alfredo Niceforo (25). This work came to hand when the present study was all but completed.

An examination of these studies reveals that argot presents the same difficulties of definition and classification as does slang. It is in the attempt to solve this problem that these studies differ fundamentally from each other and that both differ from the present study in slang. De la Grasserie finds no word in French that serves to denote with sufficient exactness the kind of language which he aims to analyze, as *argot* is unsatisfactory for scientific purposes. He has recourse to the use of the Greek base, *glossê,* on which he builds a nomenclature for many different "modes of speech." The Introduction serves to justify this method of procedure. In the first place, a language is distinguished from a mode of speech. It possesses a vocabulary and a grammar, belongs to one nation or race, and serves as the instrument of expression for all classes of the same nation. The several languages divide up territory into "vertical divisions." Within each language there are modes of speech. These forms, or modes, of speech have a common vocabulary, the same literature, and the same grammar in the same language. Their nationality is the same, they are grouped in the same place, but they become distinct modes of expression for every class of society and every profession. Thus many modes of speech are spoken in a single language. As a territory divides itself between the dialects in vertical divisions, the different modes of speech are superposed in "horizontal divisions." There is a higher mode, a lower mode, a poetic mode of language, etc., etc. In all languages there exists at once a mode of speech more material and more concrete and another more intellectual and abstract. M. de la Grasserie (13, p. 17) divides the "gloses" or modes of speech into two general classes with numerous subdivisions. If a special monograph were devoted to each of these "gloses," the whole undertaking would assume cyclopaedic proportions. This wealth of nomenclature the author finds necessary to escape the ambiguous implications of the word argot.

The English *slang* presents the same difficulties. The term is generally applied to unauthorized language whether it be in popular vogue or shunned as vulgar, or the jargon of some particular class, or the cant of criminals. The classification of slang in the present study does not aim to be so close as that of M. de la Grasserie. The most fundamental of them all and the one which corresponds to that of the work before us avoids the ambiguities of slang by fixing the limits of variability of language between the abstract standard of a class (somewhat equivalent to M. de la Grasserie's *anaglose*) and an individual caprice which may at any time for a reason or for no apparent reason make a departure from the language of the class. For this departure lawless forms may be created, or selected from any unauthorized source. It may be from the slang of a trade, profession, occupation, social class; from a provincial dialect, or the cant of thieves. This individual tendency to break through the lines of conventional language is the subject of the present study. It is the language of individual freedom, the same tendency that accounts for change in government and social life, as well as in language. The word unconventional, then, is a blanket term intended to cover all the kinds of departures from the standard of a class that it is possible to make.

In "Le Génie de L'Argot," M. Niceforo attempts to show that the two fundamental laws of argot (to which the author gave formulation many years before in his book, *Il gergo nei normali, nei degenerati e nei criminali*) are: Every group, every association however small, from the single couple to the largest group, which feels the need of defense in the environment where it lives, creates an argot for the purpose of concealing its thought; second, the more the necessity of defense and the severity of the struggle are accentuated the more does argot complete and extend itself (23, p. 7). The author's whole idea of argot corresponds with M. de la Grasserie's *cryptoglose* and with thieves' cant, or cryptic slang, of the present study. He carries the principle of intentional secrecy and class conflict farther than the facts seem to warrant. The creation of an argot by deliberate intention is an artificial forcing of language in strong contrast with the spontaneous rise and growth of the unconventional as set forth in this study. M. de la Grasserie combats the assumption of a malicious and defiant motive of language creation in the lower classes of society as if in reply to the author's principle of group conflict as repeatedly emphasized in *Il gergo nei normali, nei degenerati e nei criminali* and "Le Génie de l'Argot" when he says, "Le peuple n'a pas eu le malin plaisir, en présence d'un language trop élevé et un peu ridicule pour lui, d'y contredire en rabaissant tous les mots de l'abstrait au concret, de l'immatériel au matériel; ce serait un acte de volonté expresse, or, de tels actes sont inconnus du language" (13, p. 6). But it is possible that every country reveals a slang of a peculiar character owing to different social conditions which give it rise.

The material used in this study of the unconventional in language consists largely of a collection of words and phrases, more or less familiar in England and America to-day. Besides collecting from the English and American dialect and slang dictionaries about five thousand select words and phrases now in use, the writer has examined many of the more recent popular works in this form, and the columns of metropolitan dailies. He has had the assistance of observers who reported on valuable material and gave introspections on problems set by him. In making the selections of slang uses, the aim was to secure, in the first place, the greatest variety possible in meaning and form. No arbitrary classification was assumed, the material being allowed to exhibit itself in its greatest diversity. After the collection was made, it was found that this principle had been pursued so faithfully that it was almost impossible to make anything like a consistent classification. It was found, as will be seen later, that slang represents characteristics that answer to the most contrary terms of qualitative description. In the second place, it was noted that slang had a more copious vocabulary in some subjects than in others. On some of these subjects exhaustive lists of words were collected. The results were instructive in that they showed what the unconventional tendency of mind avoids as well as prefers.

Sources of Unconventional Language

In view of the fact that standards and tastes have a history and a development, it is safe to assume that there has always been an unconventional language, at least an inevitable tendency towards individual variation. Although what is called slang originated in comparatively recent times, the impulse toward the unconventional has from the earliest times found satisfaction in some way. It is a universal impulse which tends to manifest itself when a vernacular becomes crystallized in a literature and more especially when a literature becomes classic. The vernacular continues to exist in other forms following its own course of development to satisfy the unconventional impulse. After Homer wrote the Iliad his language became "correct," and Protagoras drew his examples from it when he wrote the first book on correct usage in Greek. With the poet Ennius began a marked distinction between Roman literature and popular speech, which was destined to remain in Italy until Dante wrote in the vernacular. In England and on the continent, where first Latin and then French was the language of diplomacy, learning, and commerce, the popular language was regarded as fit only for the ordinary uses of the world; it was, therefore, for the time the form of unconventional expression. Works regarded as having the highest scientific value were produced in Latin. And this language, or the French, was for a long time after the Norman Conquest used, as the most costly raiment, only on the most formal occasions. As long as this was true, English, the language of the masses, served to express the more informal, unconventional, and vital states of mind, the more honest emotions, the deeper feelings of love and hate, of joy and sorrow. As the distinction between the formal and the unconventional continues the vocabulary of the former becomes more abstract and pale while that of the latter becomes more copious and vigorous. This condition of language is the great opportunity of genius. It was the opportunity of Shakespeare, of Tyndale, of Bunyan; of Aristophanes in Greek, Plautus in Latin, Cervantes in Spanish, Rabelais and Moliere in French, Luther in German. All used the unconventional vernacular. Thus, for freshness and vigor of effect, writers appeal to the people in their most familiar language; but by so doing their language in time becomes classic and crystallized and is no longer the fit expression of the fluent freedom of the unconventional. Then the occasion is ripe for a new growth of unconventional forms, different in character from those which preceded it.

But the unconventional in language is characteristic of all nations and tribes of people. It may be due to social and religious relations of the tribes or to their economic life and tribal customs (22). Savage tribes often possess vocabularies specially pertaining to the arts of peace and war. In some parts of the world the women have their own language. Rochefort in "Histoire Naturelle et Morale des Iles Antilles de l'Amerique," quoted by Lasch (15), reports a language of men which the women understand but never pronounce, and a language used by women which the men do not use except to make sport of it. The result is that to a large extent the language of the men differs from that of the women. Women's dialects are to be found in all of primitive America from Alaska to Patagonia, and they are common in South Africa as proved by numerous studies made by ethnologists referred to in the work of Lasch. Magic and religion seem to require a dialect different from the ordinary language. The priestly class develop it and by keeping it aloof from the rest of the tribe cultivate popular respect and perpetuate their authority. It is due to the superstitions of magic and religion that there are special languages for fishermen and sailors, even among civilized races, for men engaged in various industries whose success is believed to be due to the favor of the deities in some way especially connected with their activities. The camphor industry, the gold and zinc industry, war, and the harvest, require among many tribes a special dialect. Besides these, there are secret dialects understood only by those who have passed through the pubic initiations (10). The savage also has his court language, his market language, even his thieves' cant. Most interesting of all is the secret language of the Maoris of New Zealand, the Hapaos of the Island of Marquesas and others, which probably originated from the play impulse of children and is used by their elders (6) also with ludicrous (31) motives (33). Schlegel (26) reports the Sala language, a humorous secret dialect invented by the Chinese children of Amoy in South China. It consists in changing the conventional speech by doubling or tripling the syllables and changing the initial letter to *s* or *l*. According to a report from "Am Urquell" in Science (27), there are, altogether, not less than one hundred and fifty secret languages. Many of them are children's languages; such as "Potter's Latin," "Dog Latin," "Robber's Language," "Goose Language," all attributed to the school children of various parts of Germany. Besides, there are the "Crane Language" of Denmark, the "Bob Language" of Austria, the "Katzenellenbogen Language" of Germany. It is safe to assert that there is hardly a locality in any part of the world without some unconventional lingo.

All these dialectic variations fall readily into two classes. In some, distinctions of form are arbitrarily made and perpetuated. Others are spontaneous creations, revealing a tendency to follow the lower, more intimate levels of consciousness. Lipps (16) distinguishes three zones of the egoistic consciousness. The first involves the activities of willing and thinking; the second, the awareness of the physical body; and the third, the world of persons and things outside of the physical self. The second of these zones is the mediating ego to the not-self, whose functioning in this capacity, although always a fact, is soon lost to the consciousness and the ego comes apparently into immediate relation to the world beyond it. Now, the consciousness of another self is gained by the same mediating ego, and through the sensible qualities of the mediating ego of the other self. But this extension of the first ego into the regions beyond it is due to the development of the individual self. And the extensions of the ego with its interests and sympathies to larger and larger groups of other selves is the result of the process of education. The savage is capable of only a limited extension of his mental and social horizon. According to Sutherland (30) only races which are capable of union have succeeded in perpetuating themselves. "The lower savages," he says, "combine in hordes numbering from twelve to eighty, the average being about forty." The 'middle savages' are capable of combining to the number of one hundred and fifty, the 'higher savages' to the number of three hundred and sixty, and the remaining classes range from the 'lower barbarians' capable of living together in towns of a thousand to the 'lower cultured' with towns of six million inhabitants. To become capable of social intercourse with a large group, the individual needs besides sympathy a certain power of abstraction and generalization to adjust language forms to the comprehension of any or all the others of the group. To become a citizen of the world requires a culture and training of which not all are capable. In all but the rarest cases does it require effort to acquire and maintain such a power of communication. The majority of any group are capable of entering into full communication with only a limited number of the group. Even the attempt to transmit thought to one hearer often fails from the psychological nature of the process. For the speaker's language rises out of specific imagery which the same language fails to yield in the hearer's mind. The symbols of language may be transmitted, but not their specific content.

Besides lacking the power of abstraction and generalization to adjust forms of language to the comprehension of the whole group, the normal individual has a strong instinct for privacy, shrinks from the gaze of the crowd, and avoids a free revelation of his individuality. And this fear of self-revelation varies with the size of the group. In the largest groups the individual's inhibitions are strong and numerous; in the smaller groups, other things being equal, they are few and weak. It is only as a member of his family that his individuality allows itself full play. Even in this group created by the most fundamental instincts, there are subdivisions. The parents have certain interests the children cannot share, the older children such as the younger children cannot share. Even the individual personality divides into parts, one of which suppresses the manifestations of another. And all the forms which language takes run in some way parallel to these inhibitions and facilitations due to amalgamations and disintegrations based on common interests.

Variations in language are due chiefly to two classes of conditions, those of a geographical and those of a social character. The first of these conditions gives rise to dialects, which are also a fruitful source of slang forms. The rapidity of language change seems to vary with the density of population. In the sparsely settled country the tendency is to preserve the archaic, in the city to adopt slang. Both conditions are sources of an unconventional vocabulary. In fact, all the diverse dialects of a country, all the provincialisms and localisms, are liable to be drawn on to furnish the vocabulary of the unconventional.

Besides, the slang of occupations and professions is also a source of the unconventional. The tailor, the shoemaker, the sailor, the mill employee, the physician, the minister, the lawyer, each speaks a language peculiar to his class to a certain extent. When for some reason one or another of the trades or professions attracts general attention, words peculiar to it are given a certain currency, thus providing another source of the unconventional. The vocabulary of the slang of a profession or a trade may, therefore, through the force of peculiar circumstances or through the power of an individual, come into unconventional and finally conventional use.

The same may be said of what we call domestic slang. It is frequently found that a family has a language of its own. Only a few changes of languages in a family, if perpetuated and subjected to the natural laws of change would in the course of time result in marked localisms and provincialisms. Family slang undoubtedly does in one way or another modify and create novel forms of speech which tend to become "homely" terms of unconventional language. It may even be true that the most insignificant member of the family, the baby, may have the greatest influence in the matter of introducing novel forms. For the baby speaks a novel language early in its life, and its influence on the language of adults as they converse with it in its own tongue is believed to be considerable. This is itself an instance of the unconventional, but it also affects the words and locutions that are drawn upon in the ever recurring tendency toward the unconventional. Infantine grammar may tend to regularity as in the case of *bad, badder, baddest;* but it also tends by analogy to produce irregularities. And slang follows both these caprices, saying *comed* for *came, goed* for *went,* as well as *snew* for *snowed, hove* for *heaved, praught* for *preached, squoze* for *squeezed.*

The several stages in the development of child language, according to Ament (2) and Gutzmann (8), are the cry, the lalling stage, and the word-forming stage. The question of whether a child invents a language of its own before it imitates its social and material surroundings need not detain us here. It will be enough to review the results of investigations made with respect to the influence of the child's language, whatever it may be, on the language of adults. It is a well known fact that a child language, developed from the parent's side, often grows up, a language fundamentally conventional with, however, so large a number of unconventional diminutives and terms of endearment thrown in as to become almost unintelligible to one not a member of the family. Ament (2, p. 33) emphasizes the child's part in the composition of the family unconventional, saying, "All the onomatopoeias and the language of the nursery in general are not the invention of mothers and nurses but of the generations of children of thousands of years, to whom the mothers and nurses have in this matter no other relation than to imitate and transmit what the children offer." Wundt stresses (38) the other side when he says, "The mothers and the nurses who accommodate themselves to the child's stage of vocal development and the child's preference for sound duplications are the real inventors of the child language." Whether we agree with Wundt, Meumann, Idelberger, Stumpf, Stern and others, that the child's language comes from the mother and the nurse, or with Ament, Lindner, Strümpell, Taine, Sully, and others, that the child is original in its early language, the fact remains that from one cause or another there arise here transformations which may at some time be the source of an unconventional vocabulary. That through imperfect imitation of sounds in the surroundings the child often produces novel effects, is not disputed by any one. These forms are taken up and repeated by the elders with humorous and homefelt emotions. The transformations may be slight, as when produced in the later stages of development; or they may produce in the earlier stages forms that no one can trace to an original. For example, it would not be supposed that *notis* is derived from *orange, turt-muddles* from *mud-turtles;* that by special association *Katze* and *Stuhl* should be called "*guck*" as reported by Wundt, and that the large number of forms repeated by Stern (29), including their derivatives, could have any originals in the conventional language. Numerous illustrations of transformations of words and spontaneous language are given in "Studies of a Child" by Chamberlain (4). Among many hundreds of unconventional designations applied to the baby by members of the family, reported by President Hall (11) from answers to a questionnaire, were names of animals, plants, food, characteristics of mind or body, names of supernatural beings, names of sounds, fictitious names, and alliterative combinations of miscellaneous and unknown sources. A few of the more original are pinkie, giglamps, periwinkle, peep o' day, brick-top, frowzle-top, lunky, yahoo, wobbler, nincompoop, roly-poly, nizzle-nozzle, niperty-tuck, mumblety-peg, and sniggle-fist.

The humorous side of the nickname and its association with the spirit of good-fellowship appears to-day in school and college life. It is regarded a mark of popularity to have a nick-name, if given from motives of cameraderie. These names are preferred in the social intercourse of the ball-field and the study-room. States and cities, as is well known, also have names for unconventional uses. The impulse to put off convention seems as natural and instinctive in language as in any other form of expression. The escape to the unconventional seems like a refreshing change to out-door life from the constrained and stifling atmosphere of convention.

Besides, there is the slang of students, the slang of the sporting world, and, in general, the slang of the street. Each of these has its own peculiar conditions of growth and origin, and also its own peculiar way to crowd its words and idioms into the vocabulary of one who occasionally puts off the conventions of language. The slang of the street grows up where clerk meets clerk, laborer meets laborer, to talk over matters of common interest. Sporting slang has its origin at ball games, the race track and on all occasions where stakes of one kind or another are set and the emotions are stimulated to their highest pitch in artificial ways.

The by-word, or sentence slang, was originally an unconventionalism with a humorous origin. The type illustrates the fate of much slang. These sayings had at first a well-understood origin. In time they retained only their emotional association, losing their relation to what called them forth. There are many such phrases now used unconventionally with only an emotional force as indicated by the fact that those using them recognize in them no other meaning. They give a "Roland for an Oliver," "rob Peter to pay Paul," "fight like Kilkenny cats," and "grin like a Cheshire cat." And yet they do not know a Roland from an Oliver, and attach no significance to Peter, Paul, Kilkenny, or a Cheshire cat. This last has been changed in some parts of the United States into "Jersey" cat and in other parts to "Chessy" cat. It makes no difference whether this refers to the design of a cat's face used in Cheshire to stamp butter pats, or to any other cat so long as it is a cat that grins. The ideation may be narrow, the emotion requiring only a slight thread to hang to. The "Cheshire cat" motive has become as general and indefinite as the phrase familiar among children, "He grinned *like everything*." Another illustration of the same thing is "to look nine ways for Sunday" (at a loss to know what to do). This is effective even though we don't know that it is derived from "to look two ways." With all its force it does not appear what Sunday has to do with the phrase, as it would seem any other day would do as well. After reflection, we may find that not to look for Sunday rather than any other "common" day would indicate a lack of intelligence; as of all days in the week not to be able to see Sunday would seem stupid, indeed. But it must be remembered that the thought the phrase yields is put into it after reflection sets in and does not appear in the emotional complex of actual language. The less essential parts of the phrase slough away and finally leave only a word or two to carry the emotion it may be intended to communicate.

The same principle applies apparently to words used in a variety of connections, many of which seem most inappropriate. These overworked words may belong to conventional or unconventional language. The fact is that here too the emotional intonation is of prime importance and the idea to be communicated negligible. Expression in this form is often limited to a few favorite words. It is primarily language for the ear rather than for the eye. It is this kind of language that to some persons has the characteristic marks of slang and that is much condemned by those who emphasize thought-content in language.

In this connection profanity might be mentioned as contributing a large number of words of hackneyed slang. They also serve for the expression of emotion rather than the communication of thought. However, they are not always intended to be heard, and are often used inadvertently and unconsciously. In their form is revealed a strong inclination to conceal their meaning, for the vocabulary of profanity is characterized by various disguises of derivation.

The cartoon is also a source of slang. Slang is often practically the cartoon in words. It is safe to say, too, that the cartoonist often takes his cue from a slang phrase. Again, the story may be a source of slang. Slang phrases illustrative of this are "put me off at Buffalo," and "waking up the wrong passenger." Inversely, it is possible, too, that a slang phrase may suggest a story.

Another source of the unconventional, altogether different from those already mentioned, is what might be called cryptic slang, or the cant of concealment created by thieves by spelling original words backwards (back slang), from the middle outward (center slang), and by the use of rhyming words (rhyming slang). Tramps, also, are said to have a secret language, and so do the gypsies whose vocabulary (3) is derived mostly from Sanscrit and other Indian dialects as well as from the nations they met in their wanderings from the East. This is an artificial kind of slang created in mechanical fashion in strong contrast with that which rises in spontaneous activities.

Language requires groups for its creation, as it is conditioned on social environment. The conditions of group life with common vital interests is necessary for habituation to forms, which language requires. That language forms may take hold of the consciousness, they must accompany emotional reactions. This may occur in two ways: first, through the immediate experience of the individual, and second (what is almost as effective), through *Einfühlung* of the mediating ego of another self. The opportunities for these reactions occur most favorably in the smaller groups in which there is a close relation to the fundamental instincts; such as the family with its homely affections, its honor, its pride; the trade and the profession, in which the individual has his living to make and the honor of the group to maintain; the sport, in which there are both natural and artificial stimulations of interest. It is in these smaller groups that the individual spends most of his time, and here his language becomes habitual and is accompanied by mental and physical activities of the intensest kind. It is in the feeling reaction that language forms take root and persist long after the individual has outgrown the interests which imbedded them in his memory. The groups also provide other favorable means of rooting language in memory, for they occasion a natural repetition of the forms and their numerous associations. Compared with the language formed under such conditions, the language of the book and the study is to many, probably to most, people an unreal thing.

To those engaged in the same business or trade there is a material means of communication near at hand and possessed in common. The immediate external world, whatever it be, furnishes the most natural means of language. Under such conditions there may be several motives for extending a vocabulary; one is, the rise of the feeling of familiarity with the existing language and the consequent desire for relief in novelty; another is a deepening interest in the material which leads to a growth of ideas and a corresponding increase of vocabulary. To the layman who has only a limited interest in a special line of work, such an increase of vocabulary is not necessary. But when through a profession or a trade, a commotion is brought about in society as a whole, when the public is aroused and becomes acquainted with the affairs of that profession, then the conditions become favorable to a transition of the slang of a class to the slang of society. This has happened in this country when the public attention was drawn, for instance, to contemporary wars, polar expeditions, the conflict of labor, the insurance scandals, municipal corruption, and the graft of big business. The use of class slang becomes general also through the more normal and constant force of good-fellowship which operates at the points of contact between the various groups as they meet individually when pursuing their several vocations.

The same thing is well illustrated in a popular sport. The base-ball enthusiast, who knows the game and gets excited over it, naturally has a different attitude to the language used on the ball grounds from that of the man who does not know the game. To the latter the many synonymic phrases used in the game seem so much mere language and slang. He sees only one way of hitting a ball and probably there is only one that he can achieve. But the enthusiast sees the same thing in many different forms and colors. Various shades of emotion strive for exact expression. It is possible to have all these expressions for hitting a ball with attendant circumstances: he *pummeled* a liner to Devore, *larruped* a home-run to right, *banged* the ball on the nose, *punched* a hit to right, *smashed* a drive, *whacked* a grounder, *slapped* an easy grounder, *planked* a sizzling one, *spiked* a one-base shot to centre, *rammed* a single to left, *lammed* a single past Larry's ear, *slammed* a single to centre, *whaled* a home-run, etc. A hit may be called a jab, a rasping single, a peppery grasser, a pop fly, a homer, a horse-shoe drive, a dinky fly, etc., according as it varies in length, speed, motion, the sound it makes, or the curve it describes. All these varieties are of interest to one who knows the game and follows it, and he must have fitting names for them. Whenever in history an interest grew up in any sport, as in hunting and hawking, a vocabulary grew up and had its influence on the general language to the same degree that the popularity of the sport became general. It is the same with the synonymy of any of the languages whether of civilized or savage races (12); the synonymy follows the liveliest interests.

Unconventional language is in a continual flux, for all words that pass from one class to another or become generally known are old words in disguise. They seem new and serve the purpose of new ones, but as the philologist Pott declared (quoted by Max Müller in Science of Language), no absolutely new word was ever created in all the history of language. The composition of new words from old ones shows, however, different degrees of originality. Words made by rule, with a deliberate purpose, like learned neologisms and cryptic slang, are to be regarded less original than those that appear spontaneously. In all cases of slang of concealment the method of disguise is known by members of the class. In the case of a coinage of a scientific term the motivation involves the impulse to form a rational association of word and idea. All that any coinage needs is an acceptable *initial* association, a small dowry of reasonable content to get a start with, it may afterwards have ever so checkered and uncertain a career. And this is because to begin a career, it must be acceptable to at least two persons. As the first class of coinages illustrates the operation of successive association in which the idea is joined deliberately and arbitrarily to a chosen word, so the second is an illustration of simultaneous association. A good illustration of the latter (35) is the naming of a craft to which on being launched a bystander called attention by exclaiming *"How she scoons!"* The craft at once became a *schooner* and has kept the name. In such a case some individual is the first source of the word, but it lives with the crowd. In this particular case *sc,* found also in an archaic dialect form *scun,* may in some way have had an influence on the coinage. The *sc* as in *scat, scoot, skate,* and other words with initial sibilations connoting motion, meant here a rapid gliding, and the continuous *oo* and the liquid smoothness of the final consonant was instinctively felt as the fitting designation of the thing.

In spite of the fact that any one may readily coin a word, not one in a hundred thousand succeeds in making a word current. Deliberate attempts have been made by many writers and scientists but with only indifferent success, as may be inferred from W. L. Mead's account of coinages (19) that have been made. And this is not surprising when it is remembered that we are not yet entirely free from the notion that the name is a part of the object. Among savages the name *is* the object and to pronounce it is the same thing as to touch the object which it designates. To give an evil thing its bad name is to hurt and offend it and invite reprisal; hence the well known euphemisms in all languages. The naïve attitude of the peasant to the relation of word and idea is illustrated in the remark that is reported (34) to have been made in admiration of the feats of astronomy: "I can understand how the astronomers can measure the distance to the fixed stars, but how they ever found out their names gets me." It seems like creating a thing to create a new word. The mountains and rivers of a country keep the names given to them by the conquered races. If the Indian name was Susquehanna or Mississippi, then that must be the name of the river.

The words of ordinary use are not intentionally created. They rise spontaneously, and are recognized as new after they have been spoken. In its essential nature speech is rooted in the emotions. The sounds a child makes before the impulse to communication sets in are all tones in their native emotional colors. They fit like the skin. The child acquires a large repertoire of sounds before it begins to echo the sounds of the environment and imitate with lip movements the oral element of expression. Soon gesture and facial expression are added to the association. In the new complex, gesture assumes an important demonstrative function in that it visibly orients sound, lip movements, and facial expression, which were at first purely imitative, to the objects to which they belong. Since the sound of words and their corresponding objects vary much more than the gestural elements of the associations, the latter through more frequent repetition gradually recede in importance from the consciousness, and soon become automatic, and finally may lose all but their psychic component. The impulses to all these activities in the child arise in feelings of pleasure and pain. They are the first and continue for a long time to be the sole determinants of action. In the course of the development here briefly sketched the child experiments with every variety of sound and form. There are repetitions and duplications, abbreviations and elongations, assonances and onomatopoeias,—there is pleasure in the language process for its own sake. The adult himself often playfully reverts to the plane of childhood, either in mimicry or from some other motive, and juggles with the sounds of words. Certain elementary sounds come to represent certain emotions because they accompany those emotions more frequently than any others. Hence, when the emotions appear certain elementary sounds appear with them, and they may combine in new ways to form new words. But every candidate for acceptance into a vocabulary needs the support of many persons to give it a permanent vogue. One of the observers in this study who also assisted in gathering material reported one slang usage that went no further than the original utterance of the person using it. It was as follows: A mother rebuked her daughter saying, " You are going all to pieces," the daughter's face flushed as she replied, " I am not *piecy.*" Another case reported was a new use of *sail* for a hat. A man and two ladies turned the corner of a city street where the wind was strong. It caught one large hat at an advantageous angle. Some one said, " Hold on to your *sail!* " Neither of these uses lived. Both were borne to the consciousness on streams of emotion. In both cases the words came up unconsciously. Another instance of an original word-form reported by one of the observers is the following: " I entered the kitchen the other evening and seeing a tin of gummy, stodgy, home-made candy, I at once exclaimed, spontaneously, ' Well, I am glad to see a little *goolush* around the house.' The descriptive adjective *stodgy* also came spontaneously, but I fancy it is a word I heard before." The word *stodgy* which the observer does not remember having heard before is used in The Mill on the Floss to apply to a distended pocket. The observer's use is dialectic and colloquial in England and Scotland where it is applied to a thick, stiff substance, including food; heavy, cloying, satisfying, also clogging, sticky. How this use got into the mind of the observer, it is impossible to say. As to *goolush* there is no such word on record. The more original effects in word composition of adult language may be due to a sort of disequilibration of mind through emotional stress or fatigue. In such compositions as *strambling* for *strolling* and *rambling, plodging* from *plodding* and *trudging,* the syllables were jumbled together because the mind used its available energy to hold the idea and nearly lost the sound association.

The number of sounds that can be made by the organs of speech is indefinitely large. But each language actually does contain only a certain limited number of phonetic groups. There could be unlimited variation in English speech to satisfy any caprice however unique and individual it might be. But the range of individual variation is limited by social restraint. The experiment has been tried to coin words simply as words and without reflection as to meaning with the result that the observer finds it easy to bid syllables to rise in his consciousness and unite. But when instead of a simple unreflective coinage the observer is to communicate an idea on the spur of the moment through a coined word, the process is immediately complicated and he finds himself under the immediate necessity of compounding his idea with a word compounded of the spirit of the individual and of the social self. He instinctively uses elements that are already familiar and fits the word into a familiar context. The rise of an unconventional form of expression requires individual initiative, a social atmosphere unified by a common interest and a common focus of attention, and concurrent emotion of a favorable kind.

There is a time when language rises in spontaneous fullness but there is also a time when children become interested in things rather than words and when their prime law of life is to get the most with the least effort. At this time they read much and say little and express themselves in the easiest way. Gesture language with nodding and shaking the head is used, without words. This is the age of abbreviated syntax, and short-cut slang. This seems the very opposite of voluble slang discussed before. Both these variations from the standard usage are characteristic of youth. Age and conservatism and convention seem to belong together. Gauchat (7), in his study of the phonetic character of the dialect of Charmey, Switzerland called those ninety to sixty years of age, the first generation; those sixty to thirty, the second generation; those thirty to —, the third generation. His results show that in the first generation the phonetic laws are more or less latent, to appear irregular in the second, but "se repandre triomphalement dans la derniere." The returns from a questionnaire sent out by President Hall (5) in regard to the prevalence of slang among school children show that the curve of slang begins low at nine, rises very rapidly from eleven to twelve, reaches its highest point at thirteen but is still high at fifteen, then falls rapidly to eighteen and twenty-one. An investigation (20) of the usage of the high school students of Madison, Wisconsin, revealed a larger vocabulary of slang in the Freshman than the higher classes. The facts are well known and it is no assumption to say that youth in the limits set by Gauchat's third generation is the age of the unconventional in language as in other manifestations of life. In spite of the repressions of conventionality, the spirit of youth overleaps all bounds (9), gives vocal inflection a new range, forms new phonic variants, and cuts out new channels of speech.

The unconventional language of any period reflects the social and material environment of the time. Conservative use is slow to adopt a new imagery, yet theoretically, a language which reflects the immediate environment has the advantage of freshness as well as intelligibility. The imagery of mountains, trees, land and sea, is always with us. A language that reflects things that change tends to become stale. Among the happiest effects of slang are such as have been produced by comparatively recent American writers who have transferred the material of language to the field of improvement in industry and advance in science. This tendency gives us such forms as a live wire, ready-made youth, to give the shut-off signal, to throw in the high-speed thought-gear, to turn on the lurid language, to lose the combination, to ring off, to speed up, to pull wires and lay pipes, to put the brakes on, to shut off steam, to flag one, to switch the current onto one's self, to put the Teddy sign on something (to mark as false). The last presidential campaign gave us "bull moose," and "moosette," and the reputed characteristic of the people of one of the States "who want to be shown" gives us "in this matter, we are all Missouri."

Many of the usages here cited are not yet to be found in the dictionaries of slang. They are still near their original source. Now, much of the slang of the dictionaries is such as has had at some time a limited vogue but is not now as a rule to be traced further back than to a social group among whom it was current. The way of life of some of these groups is itself taboo, and puts the tag of the forbidden on their vocabulary. Here the question of formal incorrectness of phrase or far-fetched association need not enter into consideration, for the unconventional life described by the words marks them at once as vulgar slang.

Much of the slang found in the dictionaries is relatively fixed and hackneyed. It represents that part of unconventional language which has gained favor and has often been repeated in a limited group but for some reason has never become part of the standard language. It has, therefore, acquired a character whose psychology may be investigated. This slang vocabulary shows what are the favorite themes, what are the special interests of slang that gains a temporary foothold in the dictionaries. Recurring to a principle referred to before, a large number of words on the same theme does not indicate useless repetition but a synonymy of ideas; it reveals something like technical specialization, interest and analysis, a perception of the finer shades of distinction which come only to the initiated. Judging by the number of words found in the slang vocabulary, its interest centers largely in the gambler, the thief, the drunkard, and the libertine. If the generalization be drawn more widely, the vocabulary shows that money and the sensual indulgence which it purchases are the dominant interests of this kind of slang. On the other hand, it ignores all that belongs to the routine duties of ordinary life; it does not characterize the humdrum and commonplace. It has few words for work; indeed, the word work itself means to steal or to deceive. There is little in the vocabulary to suggest naiveté, innocence, and spontaneous playfulness. It is purely unsentimental. It castigates every kind of excess of sentiment or sensual indulgence. Although its interest centers largely in sensual indulgence, its attitude to all who show a weakness either of a moral or a mental kind, to all who are unheroic, is that of a "Dutch uncle," whose every word is reproof. There are more than five hundred words or phrases in slang relating to the possession or deprivation of money. The present writer collected up to four hundred and fifty without by any means exhausting the supply. There are hundreds on games and gambling, which could be classified also under money. On eating and gluttony the writer's collection, which is incomplete, numbers four hundred. On thieving and allied roguery there are not less than eight hundred. Farmer and Henley's dictionary alone contains under the head of "*thief*" between four and five hundred synonyms. The slang vocabulary on money is itself relatively prosy and commonplace. There are many names for money which must have gained currency on account of the peculiar influence of the persons first using them or some peculiar association in the place in which they were first used, for they seem simply names without any apparent reason for their existence. There are others suggesting appearance, as, shiners, tin, browns, buttons, chips, bluebacks, the long green, green-goods, shad scales, canary, glistener, cart-wheel, etc., etc. By a sort of irony slang characterizes what is so hard to secure by names for the most commonplace things, hence, rocks, brads, dough, dust, clinkers, horse-nails, bones, hard-tack, soap, flour, hard-stuff, pap, rivets saw-dust, shells, shot, etc., etc. Other epithets in which the association lies deeper are, the needful, the wherewithal, ballast, grease, honey, palm oil, salt, tonic, etc. A few of the names are so strange in form as to suggest something rare: scads, mopus, rhino, tlac, dooteroomus, tusheroon, mejore, etc., etc. Although the interest of slang in money is shown to be considerable, money itself seems too prosaic for unconventional language in its most characteristic and interesting forms. Here as in other themes its interest lies chiefly in excess. Recklessness, miserliness, acquisitiveness, come in for its scorn. To fool, potter, muddle, fritter away money, to be a tight-wad, to be tight-fisted, to be a skinflint.

Slang characterizes without mercy physical defects and peculiarities, and infirmities incident to age. It also castigates all forms and phases of stupidity. It sends one on a sleeveless errand, for pigeon's milk, a straight hook, or the diary of Eve's grandmother, and thus blambustercates, bamboozles, bilks, fakes the kidment. It knows how to flim-flam, to flummox, to gild the pill, to gravel, to gull, to haze, to jimify, to jolly, slumguzzle, to soft soap, to spoof, to string, to stuff, to sawdust, to take in, to work the poppycock racket on any daffy squirt or dotty chucklehead or dippy mushhead, on any crazy kioodle or concatenated chump.

Although slang is always breaking with conventions, it is especially severe with those who have idealistic tendencies. It ridicules belief in what is generally regarded as impossible as a mere figment of the imagination or a delusive hope. There are air-built schemes, air-mongers who attempt to square the circle, to wash a blackamoor white, weave a rope of sand, extract sunbeams from cucumbers, set the river on fire, catch a weasel asleep, teach a pig to play the flute, catch the wind in a net. A person who looks to the future for the fulfillment of his hopes has maggots, bugs, wheels in his head, sees the flying Dutchman, the great sea-serpent, or dreams of the land of Prester John.

Slang tends to exaggerate perfections as well as imperfections, but in the latter it is particularly rich and extensive in its vocabulary. In characterizing quick action it is summary and direct, for the slow and uncertain it makes derogatory comparisons. Vanity, pride, and hypocrisy are the usual targets of its scorn. Qualities, good or bad, are more than superlatively characterized. It produces its effect by its free range over all the field of the familiar and the contemptible and selects such an imagery as shall not alone be readily conceived but also intimately felt. It is particularly acceptable when it hits off an evil and is applicable to the other fellow. It delivers blows and is capable of checking abuses. It prefers the abrupt and the shocking. It is superior to accepted use through its emotional force. It almost invariably makes implications of similarity between persons and the animal world and the disgusting or immobile or inert. It is peculiarly adapted to excoriation of abuses which come through somnolent convention, custom and habit, to social and communal weaknesses, to formalism in religion and politics, to sentimental dreams of unrealities, in fact, to all the forms and features of conventionalism.

However, it does not manifest a consciousness of purpose. It has results simply by being what it is. An investigation of the vocabulary on drink will better than any other reveal something of its peculiar character. Intoxication through drink does not itself alone stir the imagination of the subject, it also appeals to the imagination of those who see only the uncertain and often unexpected result of drink. It is a well worn theme in all literature and the slang vocabulary on strong drink is unusually rich. The state of intoxication is itself favorable to the creation of some of the most characteristic slang expressions. It extends the limits of emotional excitement far above and below the average, ranging in the field of the superlative and often showing a clearness of penetration, a happy abandon, an unprejudiced candor, a sense of individuality and personal immunity, a heartless precision of language that " madness often hits upon." The language of a man in liquor seems the very antithesis of reflection, and it is plausible to suppose that the individual source of many of the slang epithets on this theme emanate from alcoholic erethism. The social effect of a spree is to raise individualities while it reduces the common sense relations. The most effective of the bar-room epithets are repeated and gain a certain currency, eventually finding their way into the printed collections.

As the vocabulary on drink and drinking is probably the fullest and certainly the richest of all the themes for which slang shows a preference, a somewhat more extended investigation of the impulses involved is desirable. It is, of course, to be taken for granted that slang utterance, especially considering the conditions under which it usually appears as indicated above, is a spontaneous manifestation of unconscious processes. The atmosphere of gay good-humor, and lack of deliberation which conditions its rise, need not be further considered. And the vocabulary on drink is large enough to offer something like a complete gamut of expression on a single subject. The writer's collection of more than a thousand words will reveal the possibilities of slang in so far as it can be inferred from the synonyms of a theme. The vocabulary shows a wide range over all the subjects related to drinking. It describes the drunkard's appearance in considerable detail; it has many names for each of the different kinds of drink; many names for the place in which liquor is sold; it comments on the drunkard's actions, interprets every movement he makes and follows his mental and physical states from the time he feels a " spark in his throat," until he is " pickled " and " at rest." It involves condensation, comparison, exaggeration, positive and negative, repression by euphemism and irony, the realistic literal and the brutally coarse.

Many slang words are taken from the language of the shambles and call to mind some of the vital parts of dismembered animals. It is these words numerously compounded which one uses to describe the portly appearance due to excessive indulgence. In these compounds the recurring sounds of *s* and *z* suggest the sizzing, foaming beverage and call attention to all the disgusting physiological processes involved in drinking to excess. Sow-drunk, swine-drunk, involve comparison with pigs wallowing in filth. A swill-pot involves comparison with a receptacle for waste and the body is regarded as inert and immobile down into which things are poured. Suck and sucker are numerously compounded suggesting a weak and helpless doting on drink.

Sometimes it reveals a Gargantuan exaggeration expressing a wish for a throat a mile long and oceans of drink. To imbibe is to take a shove in the mouth and to irrigate, to take liquid fire, bottled earthquake, and chain lightning, Or again, the words are much underdrawn in order to exaggerate quality. Now a drink is simply described as a taste, a smile, a nip, a nipperkin, a thimbleful, a toothful, dew-drop, or only something damp. In the various states of intoxication, the victim now sees large, now small.

Sometimes long, dignified words somewhat conceal meaning in form, showing a tendency to repression rather than to revelation and exhibition. Now the drunkard is a potator, a borachio. He is pongellorum, hiccius doccius, palatic, has a touch of boskiness; to drink is to nippitate, to hit up a libation; to be drunk is to be obfuscated and tosticated.

Again it names drink by its result with downright literalness calling it misery, poison, soul-destroyer, family-disturbance, blue ruin, and hell-broth.

Sometimes the throat and mouth are compared to things lifeless and inert and the process of drinking is represented as purely mechanical. The receptacle for drink is gutter lane, beer street, common sewer, drain, funnel; to drink is to sluice the dominoes, the ivories, the red lane.

It describes all degrees of drinking and drunkenness in mild and severe terms. The drunkard is thirsty, tries a smile, draws the cork or cracks the bottle, takes a nip or wets his whistle, sluices the gob, looks lively, becomes mellow, is in liquor-pond, is ramping mad, tangle-footed, and laps the gutter. In his worst state he has the gallon-distemper, the barrel-fever, the blue-devils, the jim-jams, the jumps, the shakes, the triangles, and the uglies, and finally sees snakes and pink spiders.

However, the large majority of terms used are repressive and euphemistic. A man in liquor has a touch of the brewer, a drop in the eye, has a guest in the attic, is full of Dutch courage. A drink is a morning rouser, a reposer, a sparkler, a rinse, nectar, French cream, caper-juice, a revelation. The drinker is afflicted, all at sea, a bit on, concerned, disguised, in his altitudes, exalted, gilded, glorious, salubrious, chirping merry.

Another important class of words assumes a medicinal value for drink. Here drink is an appetizer, a digester, invigorator, refresher, settler, soother, warmer, toast, medicine. Drink inspires also certain qualities making a person pot-sure and pot valiant, and as indicated by forms of invitation to drink, it suggests the attitude of defiance to all remonstrance, admitting that it is deathly and willing that it shall be: nominate your pizen, let's drive another nail into the coffin, let's hide some more ruin.

In some cases the association is far-fetched and the ideation narrow so that its relevance is no longer apparent; in others, a part is selected to dominate the whole process of drinking with a penetrating insight. The doting toper looks through the glass, reads the makers name, dips rather deep, bites his name in, dips his beak. A drink gives nature a filip, paints the town red; a drunken man is a ship in full sail, with a full cargo on board, carries a blossom nose, is an ensign bearer, with a flag of distress. The place where liquor is sold is a devil's house, a gargle factory, a roosting-ken, an O-be-joyful works, a wobble-shop. There are not less than twelve synonyms for beer, nineteen for porter, twenty-five for gin, and thirty-seven for whiskey. Slang makes a fairly complete inventory of the business as a whole, and shows up its results in damning variety. Its exhibitions and revelations of reality, its ludicrous insinuating euphemisms are effective because they *are* often coarse and indecent in imagery; because they *are* usually brief and direct; because they amuse, startle, shock; because they *are* different for whatever reason from what is customary; in short, *because they are slang.*

On the more serious subjects slang is often without the least trace of feeling or sentiment. It makes light of suicide, hanging and death. The epithets on hanging, although mostly obsolete, reveal a heartlessness that could have no place in conventional language. The victim dies of hempen-fever, has hempen-fortune, and leaves a hempen-widow. In the days when hanging for various reasons was common, the victim was said to go to the deadly never-green. The gallows were the sheriff's picture frame, the scrag-squeezer; where the victim cuts a caper upon nothing, dances upon nothing in a hempen cravat to a Newgate hornpipe without music, has a hearty choke (artichoke) with caper sauce for breakfast, kicks the wind with his heels. In Western America he is roped for business purposes, telegraph-poled, yanked up, jerked away, and afterwards planted in the sage-brush.

Slang reference to the devil suggests that he is a familiar acquaintance of long standing. In nearly all cases he is referred to as old, and in something like an approximation to sympathy, he is given a relatively familiar Christian or descriptive name. There is no sign of doubt as to his personal reality. He is Old Nick, the Old One, Old Blazes, Old Bendy, Old Driver, Old Harry, Old Scratch, Old Toast, Old Goose-berry, etc. To the church and the clergy the slang attitude is as a rule irreverent. The minister is the gospel sharp, devil-dodger, fire-escape, snub-devil, gospel-grinder, the duck that grinds the gospel mill, and head clerk of the doxology works. It has, however, created *sky-pilot,* an epithet of considerable poetic significance.

In slang's attitude to death it differentiates itself most clearly from conventional language. Here is an individualism of the most undaunted type, a virile aloofness from all the sense of fear which the king of terrors inspires, a feeling of personal immunity from the all-destroyer; perhaps a pretense of indifference, a cheap linguistic bluff concealing and possibly diverting or catharsizing fear, like the small boy's whistling feat on passing a grave-yard at night. To die is to peg out, to go off the hooks, to lose the number of one's mess, to be put to bed with a shovel, to take an earth bath, to turn up one's toes to the daisies, to go to grass with teeth up, to mention only a few of the more characteristic phrases. It may be motivated by an exaggerated philosophical attitude to the inevitable, a means of summary dismissal of what in conventional thinking would be unpleasant to contemplate. Whatever it is, it is here that unconventional language reveals the most marked individualism.

Thus far our study has been limited to the creative side of the unconventional. Our inquiry has been directed to the motives, impulses, and conditions that give it rise. Excluding cryptic slang, it was found that the unconventional is a universal tendency both among civilized and savage races, that it is particularly strong in the young of all races, that it is an expression of the individual self as opposed to that of the group, that it seeks its material language basis in a fresh environment, that it is spontaneous and thrives best in an atmosphere of freedom and culminates in renaissance periods of history. Having made an attempt to discover how it comes to be, our attention will next be directed to the effect it produces.

Analysis of the Slang Impression

Most persons consider the subject only from this passive, critical side, and slang is the popular description for all usages judged exceptional. There is no general agreement as to the nature and function of slang. To specific instances of doubtful usage the reactions of different persons are often widely different and the reactions of the same persons different at different times. In a total of two hundred and ten words which were presented in the form of a narrative paragraph, sixteen observers of Clark University regarded thirty as slang. But only one of the thirty was regarded as slang by all the observers. One of them found a total of only three; another, a total of twenty-seven slang words. The individual judgment of the observers seemed unstable, so that the writer believed the results would not be the same if the experiment should be repeated. Accordingly, a month after the first test was made, new copies of the same paragraph were handed to the same observers, with the request that the slang words be underscored. They were not informed whether or not it was the same paragraph they had seen a month before. The result was that the most consistent observer who in the original test had marked twenty-seven, now marked a total of twenty-five, having added one and dropped three from the original number marked. Another, the most unstable, who originally marked seven, now took away three from the original number, and added three. The question, therefore, as to what words are slang seems not only a matter largely of individual opinion; it seems subject also to the variation due to temporary attitude or mood in the same person.

It is in the incongruous associations exhibited in slang diction that words arouse in us feeling attitudes (22) which in conventional usage are made dormant by habit. One does not realize how strong a hold established language has upon him until he meets with a novel slang substitution. It can thus be shown that all the effects of language finally reduce to feelings of relation, feelings of congruity and incongruity of association. And it is to the level of the feelings that one must needs go in the endeavor to acquire any new forms of language. In the first stage one must hear the strange sounds, feel the muscular movements required in reproducing the consonants and the various degrees of tension and pressure required in rendering the value of the vowels. When the acquisitions of the perceptive stage are made contributory to the performance of an act, the transition to the memory stage begins. After frequent repetitions and consequent habituation, only such and so many acquisitions of every lower process are used in the higher as are needed to attain the higher aim. The mind is utilitarian, subordinating all the perceptions and memories not needed in the achievement of a higher purpose to the field of the unconscious; in other words, there is a final elimination of nearly all but the motor phase of mental imagery and that is limited to a more or less latent rôle. Although imagery is thus subordinated, it still manifests itself as feeling or attitude.

In this stage all the conscious antecedents of speech are an aim (1), a will to speak, a feeling of suspense, and a sense of effort. The words take their places which long continued use has habituated them to, and there is a feeling for association and connection of words which only comes into consciousness when its usual forward flow is checked or interrupted. Ordinarily one knows neither before speaking the words he intends to use nor after speaking the words he did employ, so closely have the language processes adapted themselves to the various demands of speech. All one does is to begin and the words come in their predetermined order. This is presumably not accurate as an analysis of the process for all persons, for it depends on the degree of mental attainment and the specific aim of mental activity. Not all of the same age have the same powers and there are different stages of development in different periods of life. There is an age of "Anschauung" or perception, and memory and imagination, and an age of the memory of logical relationships. The mind adjusts itself only to the most immediate need, neglecting what is not useful and reducing to unconscious automatism of a relatively rigid pattern all that is ancillary to the aims usually in the focus of conscious activity. Language itself becomes condensed in the process of this development.

Language belongs on its own account to the perceptive and imaginative period of life. It is this time which is favorable to the rise of the unconventional, to the testing out of the newly acquired language powers. This is the period of narrow ideation and exuberance of expression. It is the plastic period of tolerance of change and love of novelty. In the later period of abstraction when there is closer equilibration of thought and greater economy of expression, a stronger passion for unity, the unconscious attitudes have become more rigid and the feeling for word relations more definite. This is a period of conservatism and intolerance of change.

It is due to this habituation to the form language usually takes that it is possible for one to anticipate in a general way what the course of a person's thought will be. One knows at the very beginning of a sentence another person speaks, something about the direction the thoughts will take. And as it reveals itself more and more, the field of its possibilities grows narrower, the thought becomes more definite, the possible becomes the probable and ends in the actual, and the suspense of expectation keeps rising to the close because no part is complete until the end is reached. More particularly does one anticipate the language itself. There is a certain limited vocabulary to be expected but still more limited is the number of idioms used. The idiom, which has been called the characteristic style of race in expression, becomes most thoroughly habituated. Language is, therefore, most conservative in its idiom, less conservative in its word-forms, and least conservative in its word-uses. In other words, the form the expression will take is relatively familiar; the words to be used are not so readily anticipated, the uses to which the words are put admit of the greatest variety. Violation of the idiomatic form is, therefore, the rarest kind of innovation.

The slang impression as it occurs in the passive attitude involved in cursorily reading a paragraph is due to a conflict between the anticipation and the reality or it may be due to an agreeable surprise at the difference between the anticipated and the real expression. Consciousness comes into the closest contact only with the obvious aim of its activity. The process of reading among those practiced in the art has long gone by the perceptive stage. In the reading of ordinary matter in standard English the attention is directed to the end of the unit of thought, utilizing only the minimum of perceptive material. Even the imagery, particularly in texts not purely descriptive remains relatively unnoticed. Memory takes the place of experience and mere symbols the place of memory. The word-symbol has the same effect on the psychic process *as if* it were the experience. The common factor that remains in all the stages of the progress, however, is feeling which is throughout the same in quality even though it suffer diminution in quantitative extension. There is a feeling for logic which is also a result of use. It is possible by reflection to retrace the memory associates of the feeling, but without reflection the feeling though present is not readily accounted for. When one is asked why he regards a word as slang the reply is as a rule "I cannot tell why; it is simply a feeling." But the feeling is unusual and striking in the slang impression and its cause lies nearer the surface than that which goes with customary and conventional language.

The slang comes into the divined but unconscious automatic pattern and by its novelty either stimulates the thought process or interrupts the forward movement through logical or emotional incongruity. This may be illustrated graphically by a section of a circle of which *A* is the center, BC the arc, and AB and AC the limiting radii. The direction from point A is determined by the place the matter to be heard or read has in the complex of experience. The limiting radii mark off the field of facilitation. The initial attitude becomes progressively more definite. In a unit of material to which one has become fully habituated, progress from A is free and uninterrupted, the thought is at the focus of consciousness and the language as such away from it, suspense increases, comprehension only relatively complete as far as it goes, keeps closing in, until the unit ends in BC. If a new word is included in the language material, for the moment *it* falls into the focus of consciousness, leaves a gap in the thought, and the forward movement does not fully close in on the arc BC. It would be the same, of course, with any new word in any context. But with slang there is something more. The context indicates that the new word is gratuitous and the slang impression of a disagreeable kind involves the disturbing sense of the logically unjust and the emotionally unrelated. This feeling is strong in the case of words of familiar form. In every case, however, the fundamental cause of disturbance, or it may be of agreeable feeling, is in some maladjustment or happy accident of association which experience has made into a more or less definite pattern. In the following several such effects are illustrated:

"It was all I could do to keep my eyes off his suit."

"It was all I could do to keep my eyes off'm that trousseau of his."

"I said, 'You must not care if people stare at you; they always do that to strangers.'"

"I said, 'You musn't mind folks giraffin' at you; they always do that to strangers.'"

"My friend said, 'Didn't I see you earlier in the evening accompanying about the city a gay young fellow in a striking suit of clothes?'"

"My friend said, 'Didn't I see you driftin' around town earlier in the evening with a young sport in morning-glory clothes?'"

Slang phrases often possess a greater wealth of associations than others because they appeal to recent experiences rather than to dim memories. An object is named by means of one of a constellation of associations. The relation of this one association for which the object was originally named, to the object, may be lost through borrowing by another language or through change incident to phonetic development of the word itself. The original associations of the qualities of objects and the immediate association of word with meaning are part of what we shall call the content. The sound the word represents is its form. Of the slang words to which reactions were reported, a few seemed hardly more than a sound, or visual percept. Others although new to many aroused associations apart from the associated meaning in the context, and on inquiry it was found that the elements of the association called up by a word were different for each individual questioned in regard to it, although there was agreement in regard to its meaning in the context. It is the difference in the character of the associations the word itself calls up that accounts for the difference in reactions to it. This is a typical characteristic of slang. Its original associations lie on the surface, and the form suggests no meaning except what is afforded by the context. Now, with words that are in accepted use the denotation and its train of associations are in possession of the field, the original associations being no longer accessible to ordinary conscious reflection. Philological science is concerned with the revival of these buried associations so as to increase the total number of associations and thus give them a stronger hold on the mind. It discovers the *raison d'etre* of the word and often unearths incongruities of association as capricious, irrational, and objectionable as any in modern slang.

The character of the slang impression often depends on the attitude of the hearer to the material source of the word or phrase. He may have a superstitious aversion to the source, whatever it may be, or he may be indifferent to it, or take a nature lover's delight in it. The cause of this difference of attitudes may lie in the deeper racial levels of the consciousness.

Words which produce the slang effect arouse associations which are incongruous and incompatible with those of customary thinking. As a result they arouse disgust or produce the effect of the illogical, or they may offend the taste simply through their novelty. But it is not until slang epithets are applied to persons that they become particularly objectionable. Their use now becomes a matter of morals. They lower the sense of human dignity and cause pain. It is this that de la Grasserie calls 'argotic metamorphosis.' It consists in three stages of descent. First, in applying names of the coarser movements and parts of the body to mental activities—somamorphosis; in the use of names relating to animals and their actions—zoomorphosis; and in the use of names relating to inanimate objects—pragmamorphosis. It is only between companions whose friendship is unshakably secure that such epithets become humorous. The following are examples chiefly of the last two: To take one's lid (hat), to leak or work the sprinkler (to cry), to peel off the clothes, to swat one on the map (face), to be skirt-shy, to be parlor-broke, a rat and book agent terrier, a full-jeweled jay from the Middle West, an upper-case I with feet. However, epithets from familiar material sources may also be complimentary: a daisy, a jewel, two jewels, a honey, a bud, the stuff, a top-notcher, the main stem, the real thing. The same object may be associated favorably as, "He is some pumpkins," or unfavorably, a pumpkinhead, a big-bug and a humbug, a bird and a jay-bird. The favorable and the unfavorable may even be combined as in the slang paradoxes, white lies and clean oaths. Associations often radiate from a common center and may be either favorable or unfavorable to the original. For instance "horse" has given us one-horse business, horse-laugh, horse-medicine, to balk, to trot out, all derogatory; but also wheel-horse, horse-sense, a whole team (from one-horse). By cumulation this idea rises to a climax in wheel-horse, a whole team,—and finally as said of Grant in the Civil War, "He is a whole team, a horse extra and a dog under the wagon." In the same way beginning with "goods" slang gives us by cumulation: "Yes, you are the goods, the whole cloth, the whole cloth and a yard wide, you are the goods duty-free and half way to the warehouse in a little red wagon."

The choice of familiar gross material as the language basis indicates an intention to be clear, whatever other qualities may be lacking. This kind of slang, therefore, emphasizes the content, the idea associated with the word. It is dynamic and exhibits sureness of aim. In cumulations and exaggerations the effect is to magnify the associated objectivity and thus to increase the effect of the association. When the associated object is found in the familiar world around, a certain degree of stability is secured for meaning, for then consciousness can orient itself with objective certainty and there is little room for individual interpretation.

But slang expressions show a varying range of possibilities of individual interpretation. Making the class just discussed as representing the greatest degree of objective clearness the starting-point, we will follow the gradations of slang in the direction of emphasis on the content with increasing condensation and vagueness of the associated idea; on the other side, illustrations will be given showing increasing tendency to emphasize form with a gradual narrowing of the content.

Slang combines the imagery of several senses in the same epithet, producing a sort of synesthetic condensation: a dark brown taste, it was so punk it was blue around the edges, to be yellow, a large pale-blue time of it. Paranomasia occurs when several trains of association meet in the same word or in the same sound of two words. In "a rest-cure job" the focus of association is in *cure* and part of another word *sinecure.* "Nothing to do but her husband" belongs to the same class. In another class, the content is more indefinite. Joy-ride, and then some, to be too too, to start something. Why women are so, to be classy, and O, you Teddy, depend much more on individual interpretation as well as individual emphasis and inflection for their meaning than the class of expressions discussed before. This class of phrases could in many instances be colored favorably or unfavorably by means of accompanying gesture or degree of emphasis or intonation or all of these . "Thing" in "*that* thing" or "that *thing*" may have various meanings. "A smooth article" is equally equivocal. In a Reginald, a Mollycoddle, an Abigail, a Willie boy, Kitty Mauds, smart Aleck, A Percy job, Johnny on the spot, slang makes a quick transition from the particular to the general.

Going still further away from the objectively clear and definite class of slang words from which we started, we come to a class in which the central factor is not thought but an emotion and in which the language plays a secondary rôle. The words consist in disguised forms of *God* and other sacred names and usually all they contain of the original is the initial hard *g* or the initial syllable *je,* also various forms suggesting hell and damnation. As words they are meaningless and subject to much change of form, being only an attendant circumstance to an explosive form of emotional expression. The use of these words, when most characteristic, is utterly unconscious.

The analysis of the slang impression has thus far been confined to the imaginal content rather than the form of words and phrases, beginning with that of relatively definite objective reference and concluding with slang of a much condensed thought content and also slang forms of an expletive character like gesture and facial expression. The course taken has been from the definite to the indefinite, from the less subjective to the more subjective in thought on one side and emotion on the other, from a narrower to a broader field of ideational and emotional activity. The more definite part of this field seems farther removed from standard language than that of the ideationally broader and less definite. The more definite an objectionable association is the less easily does it escape making a disagreeable impression. The less definite the imagery, within limits, the wider the range of possibilities of interpretation among different persons. And it is just in this that the form's chance of general adoption lies. If a word-use at once made the same favorable impression upon all it would not be slang; if it made an unfavorable impression in equal degree upon all it would remain fixed and immobile. It is the individual who looks on it with greatest favor that introduces it to conventional use. The class who hear it used for the first time probably come to think a little more highly of the word and a little less highly of the person using it. Gradually the objectionable elements wear away and it makes its way into the language.

Turning now from a consideration of slang forms made in the direction of a broadening ideation, a growing involution of form, the course now to be taken is in the direction of a growing accentuation of the formal side of expression which corresponds to a constant narrowing of the content. Expression here exists largely for its own sake. To be exuberant and redundant in expression is also a characteristic of the unconventional tendency. Language may become an object of play as well as things. Saws and proverbs are tampered with and revised to date. Maxims are echoed in rhyme: It's a long worm that has no squirm; put that in your boat and float it; smile and the world smiles with you, snore and you sleep alone. There are many verbose expressions and ironies like: he failed to connect with it, cherished some animosity, her clothes fit her intermittently, a nine-dollar bill. Negations and affirmations are often wordy: not on your life, not on your tin-type, not on your facial expression, not on your previous existence, over the left, in the neck, guess again, search me. Intensives expressing certainty are expressed in the most far-fetched associations: fan me with a brick, knock me down with a tooth-pick, wouldn't that jar the cherries on your Aunt Carrie's bonnet, wouldn't that wrinkle your raglan, jiggle your slats. To win the game is, to put it on ice, to frame an alibi for defeat. Sounds like a complete description (for I am he), to have sporting corpuscles of the crimson variety (a slang circumlocution for a red-hot sport), how does your corporosity sagaciate?—and this nonsense shades off into the very riot of language, "a refulgent and spasmodic flare-up," "a cataclystic swirl of catadioptric flashes," reminding of Shakespere's "equinoctial of quebus," and George Ade's "wollyopolis down on the gazalium." This last is the extreme limit, where thought-content stands at zero. The examples have illustrated a growing emphasis in the form with ever narrowing ideation down to the merest verbal nonsense, just as before illustrations were given to show how a relatively clear content may be represented in one case, while the others shade off to a relatively more condensed, more indefinite and elliptic a character; in other words, beginning on the one hand with representative forms and ending with the non-presentative and again going from the representative to the more purely presentative forms. Beyond the limits on the one side is gesture, on the other mere phonetic instrumentation. In this whole range of expression conventional language occupies a median zone.

But there is a certain kind of consistency in the ideation of continuous slang discourse which these disconnected phrases and the rather incongrous combinations fail to give. The effect of a well-constructed story in slang is not unpleasant. The reader, in such a case, assumes an attitude of expectation for the unexpected and the striking things follow each other in kaleidoscopic succession. He feels the need of alertness not to miss any " quips and cranks " while in the more conventional discourse he leisurely anticipates and passes more rapidly over the page. In time the continuous succession of the startling and the shocking, the succession of hits, even though happy, tends to benumb the imagination and weary and jade the mind. The emotional tension produced by slang is greater than that of the more customary and conventional, and the mind in time seeks relief from it, the book is laid down for the more restful atmosphere of the commonplace.

Further, if we look at slang in the larger compass of the continuous story, and into the nature of the thought structure underlying the language, we find a kind of association that often characterizes slang. It is not differentiated from conventional language by the fact that it involves comparison, contrast, and the other kinds of association comprehended under the figures of rhetoric, all of which are psychologically reducible to association by contiguity, but by the unusual relation of the component parts of the association to each other. There is, not always but often, a far-fetched comparison, a whimsical contrast, a disproportionate part put for the whole, an irrational attribution of a cause, an unwarranted inference of an effect,—any malrelation of associates. Instead of involving simply a word, it may control the whole conception of a sentence or a paragraph. Ordinarily written and spoken discourse limits itself to the field of reality; it aims and strives to see things as they are. Now, the sense of reality, in the first place, prefers the near to the remote, the present to the absent. The remote in place or time is potential with the impressions of unreality. In the second place, the organic forms of nature manifest a uniformity of coordination and symmetry of parts with which the individual and the race have become familiar. In the third place, there are laws in the physical, moral, and social world which experience has also made more or less familiar. In these fields lies, relatively speaking, the subject-matter of conventional thought, and here are the lines of equilibrium for action, thought and conduct, and they are the ultimate basis of the ordinary associations of conventional language. The associations involved in the mythic fancy of primitive man show a progressive development towards greater equilibration; the customary associations involved in the perception of reality have not always been what they are now. In the child they are naïve and innocent and experience has not yet brought them to the conventional pattern. In the savage they seem to be in a state of arrest. The making of associations consistent with the sense of reality is an acquired competence of mind, from the level of which one may revert through disease, fatigue, intoxication, dreamery or some emotional eruption to a more primitive state of mind, and approximations to it, that dissociation occurs with a corresponding weakening of the powers of coordination. Now, it is this kind of association that slang discourse *playfully* affects that the slang tendency of mind lets happen or that through emotional tension happens to mind. In clinical cases orientation may be totally lost, or there is little if any consistency to the matter. In nonsense verses there is at least the scheme of the verse and the rhyme, and often much more, to reveal a sane sustaining principle. In the ideations of slang there is at least the simplest organizing principle of temporal continuity, and often much more, to show the difference between mere fooling and the incoherence of insanity.

In "A gray-haired agriculturist took his youngest olive-branch *by the hand and led him* to a Varsity," the mixed figure is emphatically brought out by the words in italics, as if to remind the reader, by the exaggerating touch, of the initially conceived incongruity of relations. There is harlequinade exaggeration in "The salt tears trickled down *through an archipelago* of freckles" and "He was one of these mushy-looking, soft-spoken, biscuit-haired, white-livered, young wrist-slappers; with a complexion as *ruddy as a pail of lard, skim-milk blue eyes,* and a set of parlor manners that was as good as a correspondence course in etiquette just to watch."

The slang effect may be produced without a slang form or use, as in "The name she called herself (in the back of that head of hers, with its strange derangement of hair outside and the stranger dreams inside) was Mam'selle Lisette Monet. The name her parents called her (in the back tenement, with the week's wash outside and a large family inside) was Lizzy Mooney."

A slang fancy may be expanded into a short allegory as in the following: "Just back of her and a little above her Constance, the change girl, sat aloft in a little parapet. She also was at work like a besieged chatelaine, getting her ammunition handy. Soon she would be plied with money and merchandise from all directions, and she must load money and sales-slips into the cartridges, shoot at the distant cashier, make up the bundles, receive back a shrapnell of change, and pass it down to the grasping hands below."

A word purposely misplaced may add its element of humor to the ludicrous character of other incongruities: "It's American womanhood's duty to marry home industries—and not be tempted to become the grande-dame of a duke or baritone."

Or there may be confusion of the facts of history with orthographic monstrosities: "Asks me if I ever heard of a duck by the name of Pansy de Lean. 'Sounds kind of familiar,' says I—'don't he run a hotel or something down to Palm Beach?' You're warm says he, but you have mixed your dates. Old Pansy struck the East coast about four hundred years before our friend Flagler annexed it. And he wasn't in the hotel business. Exploring was his business. He was looking for a new kind of mineral water that he was going to call the Elixir of Life."

Here we have come into the field of caricature and the cartoon. While the unconventional forms of slang language are not necessary to grotesque ideation, which is often expressed in standard English, it is as appropriate to it as a means of fully realizing the idea, as dialect is to local color in fiction.

In the last analysis the impression of slang whether through novelty of form or far-fetched use of words seems to be reducible to one fundamental psychic cause. Association of words with things will in time give words accretions of feeling because of our experience with the words and what they represent. Every departure, therefore, from what custom has made habitual will result in a conflict of attitudes (22), which may be agreeable or disagreeable. Any uncalled-for word, flashy emphasis, novelty of form, or colloquial phrase, may produce this feeling of incongruity.

The cause of our attitudes to words lies, of course, as a rule, outside of the words themselves; that is, word values are *extrinsic*. In other words, their character is not due to themselves, to their own forms as much as to the things for which they customarily stand. "A rose by any other name would smell as sweet." But "rose" having been associated with the object is capable of arousing an image of sight and odor and inevitably a feeling, or in individual cases only a feeling. However, word-forms have an *intrinsic* value in some cases; they have a form peculiarly appropriate to their meaning.

Our feeling reactions to slang words may be due to the word as such, to the use it is put to, to the individual using it, to the group using it, to the thing tabooed to which it applies, or as we have seen, to the context in which it is found. The source of slang gives it an emotional coloring to which we react. The dialect of a locality or section of country affects us as strange, ludicrous and inadequate for serious purposes. It is not due to the word or the phrase in itself. It is due to the source from which it comes. The unconventional language of the family is reserved for the intimate life of the home and it is limited to family life as other private affairs sacred to the members of the household. The words originally limited to professions and occupations produce the effect of the strange and esoteric and in the humbler occupations they produce the same effect as the dialect of a locality. The feeling value of slang words comes out more clearly in connection with their origin in certain classes of society. The language of tramps, gypsies, and thieves, and that of the street, in so far as it differs from conventional language, causes an unfavorable reaction due to the vulgar circles in which the language is known to be used. Again, the coarser human enjoyments and common interests in which different groups of society may come to a common level, also give us a large body of words and phrases to which people react unfavorably on account of the things to which the words apply. Further, slang words and phrases used in connection with the great institutions of society and certain facts of life and death to which the conventional mind has a conservative attitude, arouses an unfavorable reaction due to the audacity which inspires them. Its use is the assertion of individuality against the character of that which conservative interests have guarded. Conservatism looks to the past, values the lessons of experience, and that which time has proved. It exercises restraint, limits its activities to the region of the average in conduct and speech. Slang is radical. It looks to the present, puts off restraint, and does not concern itself with limits in speech.

Our feeling reaction to words is strongest when the word calls up a clear image. If the thing associated is favorable, the word is regarded favorably; if not, unfavorably. Primarily, the determining factor is our attitude to the thing associated. In the former case the *Einfühlung* is positive; in the second, negative. Only words to which our *Einfühlung* is positive are acceptable in conventional discourse. In the second case, the more unmistakable the association aroused, the more definite the negative *Einfühlung.* Before the word is acceptable, for conventional use, this contrary *Einfühlung,* in other words, this aversion to the content of the word, must in some way wear off through change of form. Conventional language is full of instances of this process. An instance of which many might be given is the term "maudlin" as applied to drunk. An analysis of the word reveals a long forgotten association: Maud and *lin,* Magdalene, that is, Mary Magdalene, of the scriptural account, the connection of thought being in the idea *weeping.* The association of the idea, Mary Magdalene, with that of a weeping drunkard produces a conflict of attitudes. Slang words which present a clear content have for that reason an unfavorable prospect in regard to conventional adoption. If the content is more or less indeterminate, if it allows a certain freedom of interpretation, the reader can feel a favorable content *into* the word. A word whose original association is unknown would have only the aversion to strangeness against it. With use this would wear off and the word would soon produce the same reaction as the associated object. It would not come into conventional use, however, if the thing itself is taboo.

Slang will often be clear, even though it must be distasteful; it will be familiar, even though it must be coarse. Accepted use often courts vagueness for the sake of elegance, preferring the abstract to the concrete. A word's unfamiliar sound derived from a Greek or Latin base serves to reduce the force of a distasteful association and tones down its suggestiveness. But the diction of slang is unmistakably familiar because taken from the lower levels of life's necessities. The physiological processes which put man on a level with the animal world do not as called to mind in figurative language add to his dignity or support his feeling of superiority. Nor is the use of parts of the body as the material of figurative language (de la Grasserie's somamorphosis) due to reverence of the human form, for it puts them on the level of inert, passive things. It is realistic, naturalistic, unromantic. It produces the impression of too great nearness. Ordinary language like art presents things at a proper, comfortable distance. Slang imagery is 'underdistanced' (3a), too intimate. It often chooses its means of expression from physiological processes, parts of the body, the senses that require contact, organs that have the possibilities of degeneration and disease; the animal world suggesting filth, disease and vermin; domestic animals with their stupidity and passivity; clothes, utensils, implements, tools,—all the familiar world around, particularly that which is oriented primarily to the contact senses.

While words, as a rule, are the passive accompaniments of a feeling, parts of trains of association, whose chief feeling nucleation is the thing for which the word stands, the word itself having been so often associated with the thing, finally comes to stand for the thing and is looked upon as an independent entity and is unconsciously accepted as the equivalent of the thing, or rather, as the thing itself including all the feeling associations that properly belong to the thing rather than the word. Accordingly, the word itself as heard or seen will arouse dispositions or attitudes of mind.

A word having once acquired a character in this way will transmit it to unfamiliar words that are similar in form. The new words will take on meanings due to the dispositions of the familiar ones unconsciously aroused in us. That is, the feeling association of the elements of the well known words induce the feeling response to the new ones.

Certain words associate themselves easily with a meaning because there is an appreciable meaning in their sound. They represent a class of words in slang which require a separate description. They are imitative, representing in their oral and auditory form at once the meaning they are intended to convey. Here the feeling value is relatively intrinsic. It is not transferred from the outside into the word, from the object to that which signifies it, but here the sign and the thing signified are one, a unity to which the consciousness readily gives assent. Among such words is *pap,* a food for children. It suggests a movement of the lips in eating without teeth. *Pooh-pooh,* expressive of disgust, suggests an expulsive movement of the breath. *Nip* suggests closing the lips over a small amount of liquor. *Piffle,* an expression of disgust, as if with something of a nauseous smell. A *snifter* suggests a short inhalation of an agreeable odor. *Bobbing* apples, a children's hallowe'en sport, suggests in the sounds of the word just what happens in the game. *Blab* with its sharp vowel sound capable of a sarcastic use suggests a movement of the lips when talking and involves contempt of the one to whom it is applied. *Gabby* is of similar import. All these words involve in themselves movements of the speech organs related intimately with the meaning they convey.

They are slang largely because they imitate by oral means of expressing contempt. In accepted usage words are never purely imitative. The feeling tone attaches easily to these forms because feeling goes readily with imitative motion. Words that imitate movements of the lips, chewing, speaking, breathing, etc., call attention to physical processes and thus fall in many cases a little below the level of conventional language.

In this class of words, *Einfühlung* (17) is a necessary process. In the class of words studied before feeling is put into the words through activities in connection with the things which they stand for; here the activity is in the word and involves it, making the word almost identical with the mental process which completes itself in movement. It is not strange that these words cling to the memory, for they are in the form which the impression they make on the mind assumes. They represent the closest possible relation between the word and the feeling.

Similar effects are produced by means of alliteration and assonance in which slang assumes a license forbidden to standard prose. Repetitions of consonant and vowel sounds and of stresses tend to function as certifying the idea. The repetition of a negative emphasizes the negation like the repeated shaking of the head. Likewise, the initial consonant of accented syllables when repeated follows the facilitated path and the thought the phrase carries gains an assent, an inevitable sanction that comes only with truth inherent in things. Slang gives to these forms its exaggerating touch, purposely overemphasizing the form of the phrases so that they haunt the memory. Alliterations are usually found in the slang books and the sporting columns: his dainty *tap to Tim* depopulated the bases, a glove-fitting straight-front flat, to get one's goat, the seven suffering sisters. The assonantal form is more popular: the land of ganders, lamp the lad in blue, ace of spades, that cooks your goose, to fly high, to shiver one's timbers, to know the ropes, etc.

It is the unconscious tendency to imitate that, all other things being equal, determines the choice of words for slang phrasing. It is this motive of imitation that in some cases, reduces the length of conventional terms to express abbreviation and summary action and in other cases lengthens conventional terms to express the opposite. It is this unconscious tendency to harmonize feeling and word that gives the impression of fitness of one for the other in the nature of things. It is thus that words become the nuclei of feeling, and psychological symbols. Logical symbolism nucleates the idea. It makes the word the sign of a meaning it is generally agreed to contain. What has been a symbol of feeling may become the symbol of an idea. The words of cryptic slang begin as symbols of ideas. To learn their significance may require initiation into the mysteries of a sect or the secrets of a gang or a course of education and training.

In imitative phrases just discussed we have a relatively perfect union of phrase and content. In another class considered in an earlier part of this study was found an emphasis of content. And in a third class the form side was found emphasized. In this last tendency of expression for its own sake we have linguistic play where language approximates mere phonic instrumentation and speech music. Its function is to open untried sources of expression and to unlock the stores of energy of a healthy organism in anticipation of the possibilities of future expression of thought, a preparation of the forms for a future content. Such play with language is not useless nor meaningless but rather to be regarded as finger exercises on the piano which are propadeutic to skillful execution of difficult musical scores. On its passive side it means pleasure in the music of language,—"*Stimmungseinfühlung.*" It is the tuneful side of language and means immediate feeling. In the cases cited as coming under the motivation of a desire to imitate, expression is characteristic rather than musically motivated. In both cases, feeling is direct. It is due to reaction to the words and phrases themselves and not first to reaction to the thing that the word or phrase stands for, and then by association to the word itself.

SUMMARY AND CONCLUSIONS

In a subject so complex it would be vain to expect general assent to formulated views. Individual experiences with their concurrent emotions form the foundations of language. They are not the same as those reflected experiences that come to us from the printed page. This will account for the antipathies (28), otherwise a mystery (36), which well-known writers bear to certain words of unquestioned usage.

In general it seems to hold true that while the unconventional has an emotional basis it does not inform all the fundamental emotions equally. It is closely related to the feeling of individual well-being and the joy of life. It is not the language of love except as this is mingled with pity. It is predominantly objective. It is not the language of fear. It is very largely the language of anger and its sublimations in scorn, sarcasm, ridicule, irony, etc.

Occasionally its creations are such that conventional language soon adopts them, but the chief function of slang does not seem to be potential conventionality. Few slang uses are ever created, it is safe to say, with a view to secure their general adoption. The place of the unconventional is as secure as that of informal dress which is used not with the expectation that it shall some day become formal. The world of nature is the connecting link between individual minds. It is the common ground of communication. All words, however abstract they may now be, have their original basis in objects of nature. In conventional language historical progress is from the concrete to the abstract. Philological science breaks through the incrustations of form to reveal the fossil within. When to the unreflective mind this relation of language to nature is no longer evident, it reverts to uses that keep close to the concrete environment. It is the tendency of conventional usage to conceal the crassness of nature as it is the function of slang to keep revealing it.

Conventional language is the language of confederated groups. Slang rises in limited groups whose contact with the world is necessarily immediate, and intimate. These groups of society which involve different social altitudes, different interests and enjoyments, are the centers from which unconventional forms radiate. It is the language of social intercourse rather than that of written communication and books. Concentration upon common interests in the different groups gives rise to group prejudices and to a synonymy of ideas which those not members of the group cannot understand. But the usage of the group works into the deeper structure of the emotional life. There are good reasons, therefore, why the individuals of the group cling to their own forms and why they do not adopt the usage of the other groups. It is only when the groups meet in a collective capacity that the need arises for a common vocabulary. Communication with all the groups is relatively infrequent and its language is an artificial something that lies on the upper levels of consciousness.

The unconventional does not seem to be the means of economizing effort in speech. It no doubt has this effect in some cases. There is a sort of involution of language in which all forms but those absolutely necessary are spared. There is, on the other hand, a fullness and freedom of form half conscious of itself, which the unconventional tendency affects.

There is a natural slang and an artificial slang. The first is a reflection of the environment. The thinly settled country reflects nature, which is always about the same. Here language changes slowly and here rises the archaic unconventional. In the city the rapid change in the interests and conditions of life also reflects itself in language. Here occur the more radical changes in language. The second, artificial slang, is an arbitrary creation. It may be by a group as in cryptic slang or by an individual writer who as the individual poet imitates the folk epic, imitates the natural forms of folk speech. This slang as found in books is sometimes abstract and learned and suggestive of student life and the lecture room. From books it is in turn carried into conversation and serves, almost invariably, to produce ludicrous effects. Natural slang is the language of the home and the privacy of a few friends in social intercourse. It is to so great a degree the language of intimate friendship that its use by a stranger is resented as an impertinence and by a friend expected as a sign of good-fellowship.

The language that goes with manual and physical activity, that accompanies movement in work or play, makes a deeper impression than the language of the schoolroom which is inculcated in its oral form by actual practice for an average of only a few minutes of the school day of six hours. And this fact is especially significant when it is remembered that the period of greatest activity, at least in play if not in work, corresponds with the period of greatest change in language. The forms of language that take the deepest hold on human nature are those which accompany children in their real emotional experiences and their manifold physical, rather than mental, activities.

The language which expresses the excitement of the market, the games of chance, the pursuit of wealth, which informs the passions of conflict, the instincts of nutrition, and reproduction, is not always the language of propriety, grammatical correctness and logical consistency. It is the language, however, with which the nervous system in moments of tension and relaxation lives and makes a part of itself. The sources of unconventional language lie deep and its power is irresistible as a force of nature. It is the individual speaking from the racial substratum, while conventional language is the language of expediency, of social deference, and reverence of the past.

Unconventional language keeps close to the objective world of things. It keeps oriented to the sense of touch, contact, pressure, preferring a language material which is ultimately verifiable by the most realistic sense. It tends to relate itself to the immediate surroundings and to change with the changing conditions of the time. It is the language of the here and the now. It is limited to the concrete, ridicules the abstract and remote. In some of its forms, it affects a lack of orientation, is far-fetched, extravagant, because it is so sure of its realities. It has so certain a step that it plays with the objects of its thought. It knows where it wants to go and it has the linguistic means to arrive, but it may go like one uncertain of his course in harlequin fashion. Its affectations, euphemisms, and contradictions seem to rise from a secure perception of reality. It is the language of reality such as common sense conceives it.

The rise of the unconventional is due to the play impulse; to the desire for secrecy, for economy of effort, for accuracy, and for reality.

Variations from standards are ultimately referable to individuals, opportunity for habituation to them is afforded by the group.

Words are objectionable when their composition is irregular, when they are purely imitative and require sounds exceptional in loudness and quality and a mouthing articulation, when associated with an objectionable individual or group source, when they represent objectionable things, when they are sufficiently like those of the preceding class to arouse dispositions due to them, when they occur in a context which produces a conflict of dispositions, or attitudes.

The range of unconventional language is from words of the most objective definiteness to expletive accompaniments of gesture and emotion on the one hand, and to a waning content with exaggeration of form to mere phonic instrumentation on the other.

It is largely the language of expression rather than that of communication. The conventional is for distance; it holds from group to group, from generation to generation, from age to age. It tends toward permanence of form. The unconventional is for depth of appeal; it is individual and intimate. It is also unstable and temporary. But however fitful, irregular, and protean it may be, the impulses that inform it are permanent. As there always has been so there always will be an unconventional language.

GENERAL REFERENCES

1. BARRIERE and LELAND. Dictionary of Slang, Jargon, and Cant. London, 1889. 2 Vol.
2. BARTLETT, J. Dictionary of Americanisms. Boston, 1889.
3. CLAPIN, S. New Dictionary of Americanisms. New York. Not dated.
4. DELVAN, P. Dictionaire de langue verte. Paris, 1883.
5. EULENBERGER, R. Pennälersprache. Strasburg, 1910.
6. FARMER and HENLEY. Dictionary of Slang and Colloquial English, abridged from Slang and its Analogues. 7 Vol. London, 1905.
7. FRANCE, H. Dictionaire de langue verte. Paris. Not dated.
8. GENTHE. Deutsches Slang. 1892.
9. KLENZ, H. Schelten-Wörterbuch. 1907.
10. KLUGE, F. Deutsche Studentsprache. 1895.
11. LARCHEY. Dictionaire Historique de l'Argot. Paris. 3 Vol. 1881.
12. MAITLAND. American Slang Dictionary. Chicago, 1891.
13. —— ——. The Slang Dictionary. London, 1903.
14. THORNTON, H. An American Glossary. London, 1912. 2 Vol.
15. WRIGHT, J. English Dialect Dictionary. New York, 1898. 6 Vol.

BIBLIOGRAPHY

1. ACH, N. Über die Willensthätigkeit und das Denken. Göttingen, 1905. 294 p.
2. AMENT, W. Die Entwickelung von Sprechen und Denken beim Kinde. Leipzig, 1899. 213 p.
3. BORROW, GEORGE. Romano-Lavo-Lil. London, 1907. 274 p.
3a. BULLOUGH, EDW. Psychical Distance. Brit. Jour. Psy., 1912. Vol. 5. pp. 87-118.
4. CHAMBERLAIN, A. F. and CHAMBERLAIN, ISABEL. Studies of a Child. Ped. Sem., 1904. Vol. 11. pp. 264-291.
5. CONRADI, E. Children's Interests in Words, Slang, Stories, etc. Ped. Sem., 1903. Vol. 10. pp. 359-404.
6. DE COCK and TIERLINCK. Kinderspiel en Kinderlust in Zuid Nederland. 1901.
7. GAUCHAT, L. L'Unite Phonetique dans le Patois d'une Commune. Halle, 1905. 58 p.
8. GUTZMANN, H. Die Sprachläute des Kindes und der Naturvölker. Zeits. f. päd. Psy., Jan., 1899. Vol. 1. pp. 28-40.
9. HALL, G. S. Adolescence. Vol. 2. pp. 60, 74.
10. —— ——. ——. p. 232.
11. —— ——. Early Sense of Self. Am. Jour. Psy., 1897-98. Vol. 9. pp. 351-395.
12. HOCART, A. The 'Psychological Interpretation of Language.' Brit. Jour. Psy., 1913. Vol. 5. p. 275.
12a. JODL, FR. Lehrbuch der Psychologie. Stuttgart und Berlin, 1908. Vol. 2. p. 267-269.
13. LA GRASSERIE, RAOUL DE. Étude Scientifique sur l'Argot. Paris, 1907. 180 p.
14. —— ——. Psychologie de l'Argot. Revue Philosophique, 1905. Vol. 60. pp. 260-289.
15. LASCH, R. Sondersprachen und Ihre Entstehung. Wien, 1907. 36 p.
16. LIPPS, THEODOR. Grundtatsachen des Seelenleben. Bonn, 1913. 702 p. pp. 437-445.

17. ——— ———. Aesthetische Einfühlung. Zeits. f. Psy., 1900. Vol. 22. pp. 415-450.
18. Lowell, J. R. Poems. Boston, 1884. p. 617.
19. Mead, W. L. Word-Coinage. New York, 1902. 281 p.
20. Melville, A. H. The Use and Function of Slang. 1912. Vol. 19. pp. 94-100.
21. Müller, Fr. Grundrisz der Sprachwissenschaft. Wien, 1876. Vol. 1. pp. 1-50.
22. Müller, Max. Science of Language. London, 1866. 2 vol.
23. Niceforo, A. La Genie de L'Argot. Paris, 1912. 277 p.
24. Orth, J. Gefühl und Bewusstseinslagen. Göttingen, 1905. 294 p.
25. Paul, H. Prinzipien der Sprachgeschichte. Halle, 1886. 368 p.
26. Schlegel, Gustave. T'oung Pao, 1891. p. 161.
27. Science. Vol. 22. p. 103.
28. Scott, F. N. Verbal Taboos. School Review, 1912. Vol. 20. pp. 366-378.
29. Stern, W. Die Kindersprache. Leipzig, 1907. 337 p.
30. Sutherland, A. Origin and Growth of the Moral Instinct. Vol. 1. p. 366.
31. Taylor, Richard. Te Ika a Maui. 2nd ed. London, 1870. p. 340.
32. van Ginneken, J. Principes de Linguistique Psychologique. Paris, 1907. 552 p.
33. von den Steinen, Karl. Globus. Vol. 87. p. 119.
34. Weisse-Polle. Wie denkt das Volk über die Sprache? Berlin, 1904. 110 p. p. 34.
35. Whitney, W. Language and the Study of Language. London, 1870. 3rd ed. 504 p. p. 38.
36. Wister, O. Horace Howard Furness. Harv. Grad. Mag., 1912. Vol. 21. p. 204.
37. Wundt, W. Völkerpsychologie, Die Sprache. 3rd ed. Leipzig, 1911. Vol. 1. p. 617.
38. ——— ———. Grundzüge der Phys. Psychologie. Leipzig, 1880. Vol. 2. p. 436.
39. ——— ———. Sprachgeschichte und Sprachpsychologie. Leipzig, 1901. 110 p.

THE AGE OF WALKING AND TALKING IN RELATION TO GENERAL INTELLIGENCE

By Cyrus D. Mead, University of Cincinnati,
Sometime Principal of the Indiana School for Feeble-Minded Youth

It is an accomplishment long to be remembered in the family circle when the child first stands on his feet, and takes the "first step," or when he first babbles an intelligent word in which the idea is associated with the object. May it not well cause concern if the ripening of either of these instincts be long deferred? The writer was impressed, while examining the entrance blanks of children in one of our state institutions for feeble-minded, with the apparent lateness at which these children walked and talked. The question arose as to whether or not "general intelligence" played a rôle in the development of these tendencies. Kirkpatrick (4) says, that, "philologists and others interested in the origin of language and the development of intellect find very striking analogies between the development of speech and intelligence in the race and in the child." It shall be the purpose of this study to offer data obtained on the point in question. In order to establish "norms" for comparison, the results of a subsequent study will be given first, viz., the age of walking and talking as manifested in the "bright, normal child."

The children of the first group, referred to hereafter as "normal" children, are 25 boys and 25 girls, chiefly of Teachers College graduate men, with a few children of undergraduate men, and several of Columbia College graduate men. A few are children of professors. The data were obtained during the springs of 1911 and 1912. Only seven children were over 9 years of age, none was over 15 years of age, the average age being a little less than 6 years. These children represent thirty different families. The question and instructions given to the father, were:

> "At what age, nearest month, did your child begin to walk and talk?
>
> "Walking means: to take a step unassisted.
>
> "Talking means: to use a word intelligently, i.e., to associate the idea with the object."

The answers were in almost all cases verified by the mother. It might be remarked that, of the first forty children obtained at random, 22 were boys and 18 were girls. Preference was then given to girls in order to make the distribution equal. Table I shows the age (years) of the child when the data were obtained, and the nearest month at walking and talking.

TABLE I. NORMAL CHILDREN.

Boys	Age	Walked Nearest Mo.	Talked Nearest Mo.	Girls	Age	Walked Nearest Mo.	Talked Nearest Mo.
1	4	14	18	1	4	14	17
2	2.5	13	18	2	3	18	16
3	14	14	17	3	6	13	16
4	8	15	20	4	2.5	15	18
5	12	16	9	5	15	13	18
6	7	11	9	6	9	17	14
7	9	12	18	7	1.5	14	17
8	7	15	21	8	2	12	17
9	9	15	20	9	2	13	15
10	12	13	16	10	7	11	18
11	7	12	12	11	2	12	18
12	5	30	25	12	2	14	18
13	5	12	18	13	3	15	10
14	8	13	10	14	15	13	12
15	7	11	11	15	6.5	13	15
16	1.5	14	14	16	11	12	14
17	10	14	15	17	died	12	16
18	2	14	15	18	3	12	24
19	9	15	17	19	5.5	13	12
20	7	14	16	20	2.5	16	10
21	4	13	19	21	7	11	9
22	2	14	15	22	6	14	12
23	5	16	13	23	4	13	12
24	6	13	18	24	5	12	10
25	2.5	14	10	25	4	15	14

NOTES ON TABLE I. WALKING AND TALKING.

1. Of 50 boys and girls, 17 began to talk before they began to walk, 11 girls and 6 boys.

Three began in the same month; these three were boys.

2. Boys 3 and 4 are brothers. The latter learned to walk on hard wood floors, while the former had matting. Girl 2 had polished floors.

3. Boy 12 began to walk and talk later than usual for normal children. During his early years he was not a very strong baby. At 4.5 years, adenoids and tonsils were removed. His father says for two years previous, the boy had never had a restful night. He is known personally to the writer and is an especially bright lad.

4. Girl 25 was a very heavy child.

TABLE II.

Frequency Table.—Normal Boys. Walking.		Frequency Table.—Normal Boys. Talking.	
Months.	Frequency.	Months.	Frequency.
11	2	9	2
12	3	10	2
13	5	11	1
14	8	12	1
15	4	13	1
16	2	14	1
		15	3
		16	2
		17	2
		18	5
		19	1
		20	2
		21	1
30	1	25	1
11 means 10.5 to 11.5 months. N=25 Median=13.875 Guessed Average=14 True Average=14.28 A. D.= 1.64 25 percentile=12.75 75 percentile=14.69 Q.= .97*		9 means 8.5 to 9.5 months. N=25 Median=16.5 Guessed Average=16 True Average=15.76 A. D.= 3.2 25 percentile=12.75 75 percentile=18.25 Q.= 2.75*	

*Approximate P. E. obtained by calculating the semi-inter quartile range.

From Table II we see the age that normal boys begin to walk and talk; and from Table III the same for normal girls. Figures I and II show the distribution curves for the same. Judging from the general tendencies of 50 cases, we might say that:

1. Boys begin to walk at 13.875 months (using the median as a measure of central tendency), with a probable error of .97 month; and begin to talk at 16.5 months, with a probable error of 2.75 months.

2. Girls begin to walk at 13.21 months, with a probable error of 1.12 months; and begin to talk at 15.5 months, with a probable error of 2.68 months.

3. Girls walk and talk a little earlier than boys. The same is true if we judge from the average accomplishment of 50 children. Using the A. D. as a measure of variability, boys are more variable than girls.

TABLE III.

Frequency Table.—Normal Girls. Walking.		Frequency Table.—Normal Girls. Talking	
Months.	Frequency.	Months.	Frequency.
11	2	9	1
12	6	10	3
13	7	11	0
14	4	12	4
15	3	13	0
16	1	14	3
17	1	15	2
18	1	16	3
		17	3
		18	5
		24	1
11 means 10.5 to 11.5 months. N=25 Median=13.21 Guessed Average=13 True Average=13.48 A. D.= 1.28 25 percentile=12.21 75 percentile=14.44 Q= 1.12		9 means 8.5 to 9.5 months. N=25 Median=15.5 Guessed Average=15 True Average=14.88 A. D.= 2.76 25 percentile=12.06 75 percentile=17.42 Q= 2.68	

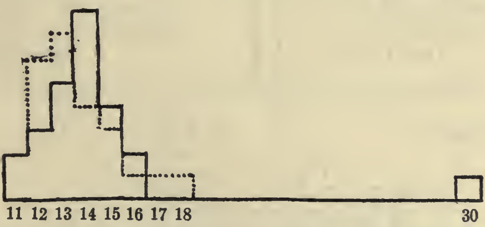

FIG. I. Surface of frequency (months) for Walking.
Normal Boys▬ 25
Normal Girls.... 25

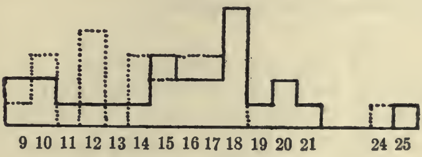

FIG. II. Surface of frequency (months) for Talking.
Normal Boys▬ 25
Normal Girls.... 25

TABLE IV.

Frequency Table.
Walking.
Normal Children—Boys and Girls.

Months.	Frequency.
11	4
12	9
13	12
14	12
15	7
16	3
17	1
18	1
30	1

11 means 10.5 to 11.5 months.
N=50
Median=13.54 months[1]
Guessed Average=14
True Average=13.88
A. D.= 1.56
25 percentile=12.44
75 percentile=14.57
Q= 1.06

Frequency Table.
Talking.
Normal Children—Boys and Girls.

Months.	Frequency.
9	3
10	5
11	1
12	5
13	1
14	4
15	5
16	5
17	5
18	10
19	1
20	2
21	1
22	0
23	0
24	1
25	1

9 means 8.5 to 9.5 months.
N=50
Median=15.80 months
Guessed Average=16
True Average=15.32
A. D.= 3
25 percentile=12.20
75 percentile=17.85
Q= 2.83

---

[1] By the formula

$$\text{“P.E.}_{\text{t. av.-obt. av.}} = \frac{\text{P.E.”}_{\text{dis.}}}{\sqrt{n}},$$

the chances are 999 to 1 that the true median will not differ from the median obtained by more than .72 months.

See "Mental and Social Measurements" (1904) Thorndike, p. 139, on the "Reliability of an Average" (or median).

[2] The chances are 999 to 1 that the true median will not differ from the median obtained by more than 1.92 months.

Table IV shows the age that 50 normal boys and girls, combined, begin to walk and talk. Figures III and IV show the distribution curves for the same. It may readily be seen that children in general (judged from 50 cases at random) are more constant in beginning to walk than in beginning to talk. One is a much more evident trait than the other. There is more chance in the latter of the observer being uncertain or biased. Again, there is a more constant performance in physical traits for people in general than for all people in the more intellectual traits. The beginning of speech might be classed as more of an intellectual characteristic than beginning walking. That comparison might be had between the performance of normal children in general, and individual children in particular, the abbreviated diaries of the maturing of the walking and talking instincts in several "bright" children are recorded. That of Preyer (14 and 15) is given first.

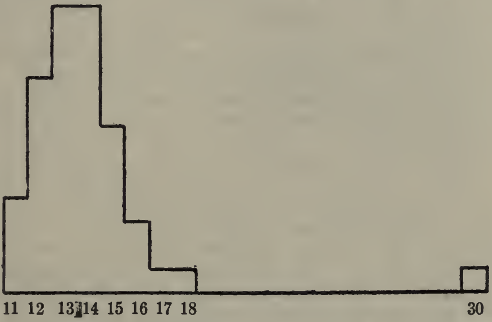

FIG. III. Surface of frequency (months) for Walking.
50 Normal Boys and Girls

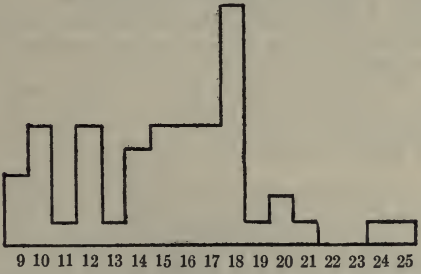

FIG. IV. Surface of frequency (months) for Talking.
50 Normal Boys and Girls

Walking, pp. 267-278:

1. "In the 22nd week the child (boy) actually raised himself to a sitting posture . . . but it was not till the 39th week that he could sit alone for any length of time; then he liked sitting, but not without support. . . . Finally in the 42nd week the child sits up in the bath, without support. . . . From the 11th month, sitting becomes a habit for life."
2. "The first successful attempts to stand, . . . without support, but only for a moment, were made in the 39th week, . . . In the 11th month he can stand without any support, and even stamps with his foot, but for all that he is not at all sure on his feet."

3. 48th week—(11,2 mo.) pushes a chair.
4. 53rd week—creeps, but can not walk alone.
5. 63rd week—"The child still walks only when he can hold on with both hands."
6. 65th week—"Cannot yet walk alone."
7. 66th week—"Suddenly, on the 457th day (15.2 mo.), the child can run alone. The day before he was entirely unable to take three steps alone. . . . Now he can run around a large table." ("And from that day forth he could walk upright." p. 275.)

Talking, pp. 77-165: (see "Conspectus" by Brown at beginning.)

1. Does not repeat monologue syllables after any one at 10th month.
2. "Some syllables emphatically pronounced to child were for first time correctly repeated in 11th month."
3. Ability to discriminate between words in 12th month.
4. "The most important advance consists in the now awakened understanding of spoken words." 13th month.
5. "Here at the beginning of the 14th month, is the idea of a definite stationary object associated with a sound heard, as so strongly that it is able to produce an independent act of locomotion, the first one."
6. Advance in repeating syllables in 15th month.
7. Touches eye, ear, etc., when these are named, not with certainty. Understands "bring," "give," etc., in 16th month.
8. "Astonishing progress in understanding what is said. Few expressions of his own with recognizable meaning." 21st month.
9. "The 23rd month brought at length the first spoken judgment." (Said "heiss" when his milk was too warm.)
10. Combination of two words into a sentence at 24th month, 707th day.
11. 810th day (27th month), gave his own name for the first time in answer to a question.

WHIPPLE, G. M. (25)

Walking:

1. Richard, son of Prof. W., "crept backwards, 6 mo.; creeping forward perfected, 7.5 mo.; first stood by holding with but one hand, 9.5 mo.; walked by holding with hands, 9.7 m.; stood alone, 11 mo.; first step alone at 13.5 months; ten steps alone, 5 days later."

Talking:

1. "Said 'mama' at 7.5 months but this may have been more accident. Imitation began to be very active at 9 mo.; date of pronouncing first word unknown. Meaning of a phrase understood at 9 mo.; four words pronounced at 11.5 mo.; 15 words had been used at 1 year; 6 word sentences were used at 20 mo."
2. Words known and used by R. at 3rd birthday about 1,800.[1]

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[1] For a condensed table of the number of words used by individual children from 16 mo. to 4 yrs. of age, see Whipple, p. 17, Ped. Sem., Vol. 16, 1909.
Also see Heilig, p. 1, Ped. Sem., Mch., 1913.
Rowe, p. 187, Ped Sem., June, 1913.

MAJOR, D. R. (10)

Notes on son's learning to stand and walk—pp. 347-350:

1. "Stood in a leaning, tottering position," holding to chair, in 46th week (316th day).
2. "Stood unsupported two or three seconds during 60th week."
3. "Walked ten feet, holding to crib, on 385th day." (12.8+ month.)
4. "Two or three steps without support, 434th day." (14.5— month.)
5. "Walked about 3 feet, without support, 445th day." (14.8+ month.)

Talking: p. 318.

1. "A great advance in the 15th month was in the appearance, for the first time, of the independent use of words or sounds to designate things the child saw or heard. The sight of the object or the sound which the child recognized called forth the name or word which had been associated with it."

HALL, MRS. W. S. (2)

Notes on son—Walking, pp. 403-404:

1. Crept forward at 405th day—(57th week—13.5 month).
2. Stood with support of finger at 38th week.
3. Stood at chair for five minutes at 48th week.
4. "While standing by a chair (364th day—52nd week—12.13 month) accidentally pushed it forward and followed it to keep his support."
5. "On same day he stood alone for half a minute."
6. "In the 60th week (415th day—13.8 months) he could walk quite steadily when supported by one hand."
7. "Took first unaided step," 428th day (14.2+month).
8. "Took ten independent steps," 435th day.

Talking, pp. 467-591:

1. "Recognized and imitated sounds from street"—44th week.
2. The word "bye-bye" used unexpectedly at 260th day. (33rd week; 8.6+month.)
3. "Said 'papa' as father entered room." 291st day. (9.7 month.)
4. "Bath, box, shoe (326), gone (331), and paper (333) were first imitated and in a few days used independently. The next word, doll, was first used spontaneously as a doll was put into his hands." (335th day—11.2 month.)
5. "First sentence, 'Papa gone,' 338th day."

SHINN, M. W. (19)

Notes on niece: (Miss Shinn says: "She was born two weeks late—a point that may have some bearing on the rapidity of early development." p. 5.

Walking, pp. 344-360:

1. "On the 267th day (8.9 month), the last of the 38th week, some one looked up from dinner to see the baby standing by a lounge, merely steadied by one hand pressing it, while she waved the other with joy and pride."
2. "On the 279th day (9.3 month), for the first time, . . . she repeatedly stood quite alone for several seconds."

3. "On the 285th day (9.5 months), she deliberately experimented in standing alone as long as she could."
4. "On the 292nd day (9.7 months), kept her balance for about a quarter of a minute."
5. "She appears to have continued to edge along a few steps now and then when holding by a chair, and after the 309th day (10.3 months), would step the length of a lounge, holding on with one hand."
6. "On the 353rd day (11.8 months), I was told that she had walked three or four steps, and this time spontaneously."
7. "On the first day of the 54th week (372nd day; 12.4 months) I saw her walk about three feet alone."
8. "On the 376th day (12.5 months) I was told that she walked alone across a room, some twelve feet, quite spontaneously."

"Good Observations (concerning the acquirement of speech) were first supplied in Germany by Berthold Sigismund in his pamphlet 'Kind und Welt,' 1856; but his observations were scanty. . . . The observations of Sigismund are remarkable for their objectivity, their clearness of exposition, and their accuracy." (Preyer—"The Development of the Intellect"—Appendix A, p. 221-23.) A few of his observations are given.

"The first imitation of sounds, proved to be such, were made after the age of eleven months."

"At the age of nine months he distinguished accurately the words 'father, mother,'" etc.

"The first word imitated by the child of his own accord (after fourteen months) was the cry of 'neuback' (freshbake), as it resounded from the street; it was given back by the child, unsolicited, as ei-a."

For comparison, the individual observations on these five children are given in table form. A much wider range, and

	Median Age (Months) Beginning to Walk[1]	Median Age (Months) Beginning to Talk[2]
50 Normal Boys and Girls.	13.50	15.70
	P. E. 1.06	P. E. 2.83
Baby Shinn..............	11.8	....
Baby Whipple............	13.5	11.5 (4 words)
Baby Hall................	14.2	(11.2)
Baby Major..............	14.5	14. +
Baby Preyer.............	15.2	22. +

---

[1] "Beginning to walk," meaning "to take a step unassisted."

[2] "Beginning to talk," meaning "to use a word intelligently, associating idea with object."

of course uncertainty, is noted in the beginning of words. In the data collected on the 50 normal children, judging from such expressions as " bye-bye " and " pa-pa " was discouraged.

The children of the second group, referred to hereafter as " feeble-minded " children, represent the results of an examination in 1910 of something less than 400 personal descriptive entrance blanks of " schoolable " cases (lower grades were eliminated) in the Indiana School for Feeble-Minded Youth, an institution of something over 1,200 enrollment. Many of the entrance records did not give the age at which the child began to walk and talk, but from those complete, the age was obtained for:

	Walking	Talking
Boys	84	56
Girls	60	36
Total	144	92

The tendency of the parent, physician or guardian filling the blank was to answer the questions:

"At what age did the child commence to walk?"
"At what age did the child commence to talk?"

in half and whole years, as " 1½-2-2½ " etc., or, " between 2 and 2½," etc. Only a few records gave the month, hence the age was taken from the records at the nearest quarter year. For example: if the month was given as " 17," entry was made " 1½ " years; if the month was given as " 19," entry was made " 1½ " years. The quarter years are thrown, half and half each way, in the frequency tables, and in plotting. In case of an odd number of frequencies on the quarter year, the " larger half " was thrown to the lower, or earlier, group, hence the figures tend to be more conservative. Such answers as, " at the common age," " at the normal age," " very slow," were not used. Cripples of course were not counted.

That the peculiarities of speech in feeble-minded children in general might be seen, the first 100 boys and girls, all grades, " schoolable " and " non-schoolable," as taken from the institution entry book, Jan. 1, 1908 to Sept. 20, 1908, are here tabulated. In answer to the questions on the application blanks: " Is the speech perfect? " " What peculiarities of speech are there?" "Is he dumb?" the following was noted:

	Number	Defective in Speech, but not Dumb	Per cent	Dumb	Per cent
Boys.........	61	22	36	7	11.5
Girls.........	39	15	38.5	7	18

Table V shows the age, nearest quarter year, at which feeble-minded children commenced to walk and talk.

TABLE V. FEEBLE-MINDED CHILDREN.

Boys	WALKED Nearest $\frac{1}{4}$-Year	TALKED Nearest $\frac{1}{4}$-Year	Girls	WALKED Nearest $\frac{1}{4}$-Year	TALKED Nearest $\frac{1}{4}$-Year
1	2	Dumb	1	...	4
2	3.5	....	2	4	4
3	4	5	3	1.5	1.5
4	1.25	3	4	...	2
5	3.5	3	5	3	...
6	3	Dumb	6	3.5	...
7	4	2	7	6	Dumb
8	1.25	5	8	1	...
9	3	4	9	1.5	3
10	2	1.5	10	2.5	2
11	2	3	11	4	3
12	4	....	12	5	7
13	4	2	13	1.5	2
14	3	3	14	2	4
15	1	1.5	15	...	13
16	1.5	1.5	16	1.5	...
17	4	6	17	2	...
18	2.5	2.5	18	2	2.5
19	1	2	19	.75	...
20	2	4	20	2	...
21	1.25	4	21	1	...
22	1.25	2	22	2	2
23	3	Dumb	23	1	1
24	2	3	24	1.5	...
25	1.5	4	25	1	1
26	3	....	26	4	...
27	....	1	27	2.75	...
28	2.5	....	28	2	...
29	2	3.5	29	1.5	...
30	1.5	1.5	30	1.5	...

TABLE V.—Continued.

Boys	WALKED Nearest ¼-Year	TALKED Nearest ¼-Year	Girls	WALKED Nearest ¼-Year	TALKED Nearest ¼-Year
31	1	1.25	31	1	1
32	2	....	32	1	...
33	1.5	....	33	2	...
34	3	....	34	1	...
35	1.5	3	35	4	...
36	2.25	....	36	...	1.5
37	2.25	3.5	37	3	3
38	1.5	5	38	...	5
39	1.5	....	39	1	...
40	1.5	2	40	1	2
41	2	....	41	1	3
42	2.5	....	42	2	4
43	1	....	43	2	...
44	1.25	....	44	1.25	...
45	2	....	45	1.5	1.5
46	1.5	3	46	1.5	...
47	1	2	47	1.25	3
48	1.5	2	48	...	2
49	3	4	49	2.5	2
50	1.5	3	50	4	6
51	1.5	1	51	1	3
52	3.5	....	52	1	7
53	1.25	....	53	2	...
54	4	3	54	2.5	2
55	1.25	2	55	2.5	...
56	2	....	56	1	1
57	1.25	....	57	1.5	2
58	....	5	58	1.25	...
59	1.5	....	59	4	...
60	2	4	60	1	3
61	1.75	3	61	1.5	2
62	1.5	2	62	2	...
63	4	4	63	2	Dumb
64	1.5	2	64	1.5	2
65	1.5	1.25	65	1.75	4
66	5	8	66	2	...
67	2.5	7			
68	1.5	....			
69	1	....			
70	2	....			
71	2	....			
72	2	4.5			
73	....	2			
74	1.25	9			
75	1.25	3			

TABLE V.—Continued

Boys	WALKED Nearest ¼-Year	TALKED Nearest ¼-Year	Girls	WALKED Nearest ¼-Year	TALKED Nearest ¼-Year
76	1	1			
77	1.5	....			
78	2.5	4.5			
79	2	9			
80	2.25	....			
81	4	....			
82	3	....			
83	1.25	....			
84	6	6			
85	2.5	3			
86	1.25	1.25			
87	1.25	1.5			

TABLE VI.

Frequency Table. Feeble-Minded Boys Walking		Frequency Table. Feeble-Minded Boys Talking	
Years	Frequency	Years	Frequcncy
1	14	1	5
1.5	25	1.5	6
2	17	2	11
2.5	7	2.5	1
3	8	3	12
3.5	3	3.5	2
4	8	4	7
4.5	0	4.5	2
5	1	5	4
5.5	0	5.5	0
6	1	6	2
		6.5	0
		7	1
		7.5	0
		8	1
		8.5	0
		9	2
1 means .75 to 1.25 years. N=84 Median= 1.85 Guessed Average= 2 True Average= 2.15 A. D.= .78 25 percentile= 1.39 75 percentile= 2.75 Q= .68		1 means .75 to 1.25 years. N=56 Median= 2.98 Guessed Average= 3 True Average= 3.28 A. D.= 1.37 25 percentile= 1.89 75 percentile= 4.14 Q= 1.125	

TABLE VII.

Frequency Table Feeble-Minded Girls Walking		Frequency Table Feeble-Minded Girls Talking	
Years	Frequency	Years	Frequency
1	17	1	4
1.5	14	1.5	3
2	13	2	11
2.5	5	2.5	1
3	2	3	7
3.5	1	3.5	0.......
4	6	4	5
4.5	0	4.5	0
5	1	5	1
5.5	0	5.5	0
6	1	6	1
		6.5	0
		7	2
		13	1
1 means .75 to 1.25 years.		1 means .75 to 1.25 years.	
N=60		N=36	
Median=	1.73	Median=	2.50
Guessed Average=	2	Guessed Average=	2.5
True Average=	2.02	True Average=	3.11
A. D.=	.82	A. D.=	1.42
25 percentile=	1.19	25 percentile=	1.84
75 percentile=	2.35	75 percentile=	3.85
Q=	.58	Q=	1.00

From Table VI we see the age that feeble-minded boys begin to walk and talk; and from Table VII the same for feeble-minded girls. Figures V and VI show the distribution curves for the same. Judging from the general tendencies of 144 feeble-minded boys and girls in beginning to walk, and 92 feeble-minded boys and girls in beginning to talk, we might say, that:

1. Feeble-minded boys begin to walk at 22.2 months (1.85 yrs.) (median) with a probable error of 8.16 months; and begin to talk at 35.76 months, with a probable error of 13.5 months.

2. Feeble-minded girls begin to walk at 20.76 months, with a probable error of 6.96 months; and begin to talk at 30 months, with a probable error of 12 months.

3. Feeble-minded girls walk and talk a little earlier than feeble-minded boys. This is true of normal girls and boys. The same is true in both groups if we judge from the average accomplishment. Using the A. D. as a measure of variability,

girls are a little more variable than boys. The P.E. would show the reverse.

Table VIII shows the age that feeble-minded boys and girls, combined, begin to walk and talk. Figures VII, VIII and IX show the distribution curves for the same. Comparing Tables IV and VIII, we see that, from the data at hand:

Normal children:

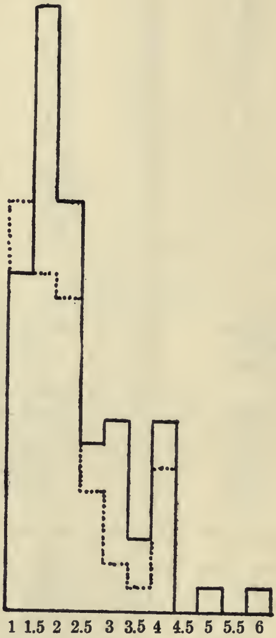

Fig. V. Surface of frequency (half years) Walking.
Feeble-Minded Boys—— 84
Feeble-Minded Girls.... 60

1. Begin to walk at 13.54 mo. (P.E. 1.06); begin to talk at 15.8 mo. (P.E. 2.83).

Feeble-Minded Children:

1. Begin to walk at 21.6 mo. (P.E. 7.56); begin to talk at 34.4 mo. (P.E. 12.8).

In other words, the median mentally defective child (schoolable) walks 8 months, and talks 18.6 months later than the median normal child walks and talks.

Many of the investigations into children's walking and talking have been physiological in nature; they have dealt with the manner of acquiring locomotion or speech, and children's vocabularies at two, three, four years of age, etc. The writer knows of no other study in which the time of the ripening of the walking and talking instincts in groups of children has been made the basis of a statistical research. Some years ago Dr. Ireland (3) in England calculated the average time that " idiots " began walking and talking. The term " idiot " has, in time past, in Europe, been used to represent a low form of mental deficiency. The term is still used broadly to include even high grade defectives, while in this country milder and softer terms are applied, that of " moron," " mentally defective," or " imbecile " children. The " idiots " in the institutions of England were generally of the lower types of feeble-mindedness, none of which type would be included in the group of " schoolable " feeble-minded children who constitute the second group of this study. That the conservative nature of this research might be seen, and that, in a broad way, three groups of children, representing differing degrees of mentality, might be contrasted, we note the observations of Ireland (p. 323).

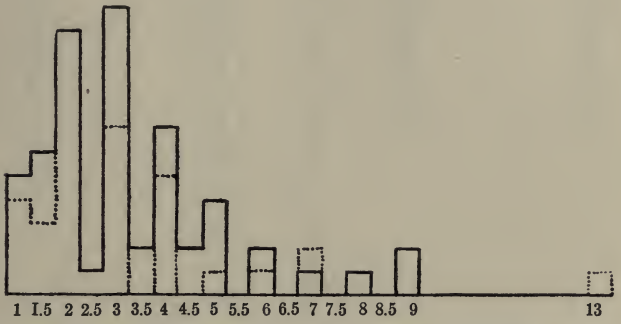

FIG. VI. Surface of frequency (half years) Talking.
Feeble-Minded Boys▬ 56
Feeble-Minded Girls.... 36

> " He (the healthy child) generally begins to walk from the 12th to the 18th month. The first appearance of speech is variable: words generally come from the first to the second year, but if the child is mute after two years we may suspect there is something deficient. Such is the ordinary course in healthy infancy; but with idiots this evolution of the senses and motor powers is much slower, and often irregular. . . . In general, imbecile children are awkward in their motions and slow at beginning to walk."[1]
>
> " Merely backward children are widely distinct from idiots. They are of slow growth, physical and mental; they are late in walking and in speaking but show no sign of brain disease."

TABLE VIII.

Frequency Table Walking Feeble-Minded Boys and Girls		Frequency Table Talking Feeble-Minded Boys and Girls	
Years	Frequency	Years	Frequency
1	31	1	9
1.5	39	1.5	9
2	30	2	22
2.5	12	2.5	2
3	10	3	19
3.5	4	3.5	2
4	14	4	12
4.5	0	4.5	2
5	2	5	5
5.5	0	5.5	0
6	2	6	3
		6.5	0
		7	3
		7.5	0
		8	1
		8.5	0
		9	2
		13	1
1 means .75 to 1.25 years.		1 means .75 to 1.25 years.	
N=144		N=92	
Median=	1.8 (21.6 mos.[2])	Median=	2.87 (34.44 mos.[3])
Guessed Average=	2	Guessed Average=	3
True Average=	2.09	True Average=	3.21
A. D.=	.8	A. D.=	1.4
25 percentile=	1.31	25 percentile=	1.86
75 percentile=	2.58	75 percentile=	4.00
Q=	.63 (7.56 mos.)	Q=	1.07 (12.84 mos.)

---

[1] Ireland, Mental Affections of Children. p. 395.

[2] By the formula

$$\text{“P.E.}_{\text{t. av.-obt. av.}} = \frac{\text{P.E.}_{\text{dis.}}\text{,”}}{\sqrt{n}}$$

the chances are 999 to 1 that the true median will not differ from the median obtained by more than 3 months.

[3] The chances are 999 to 1 that the true median will not differ from the median obtained by more than 6.43 months.

The average age at walking of 111 cases of "imbecile" children investigated by Dr. Ireland was 2.5 years. Only five began to walk at one year. He attributes lateness in walking to the deficiency in the power of mental guidance, although in some cases physical weakness may be a cause. He says:

"If imbecile children are slow at learning to walk, they are still slower at learning to speak. The lower classes of idiots never learn to speak at all. Of 103 cases of which I have notes, 36 were found mute on entry, and 67 could speak more or less. The average time at which they began to speak was four years and three months. (4¼ years.) Only four were noted as having begun to speak at one year. Sometimes they began to speak as late as ten or twelve. . . . they had no ideas to express."

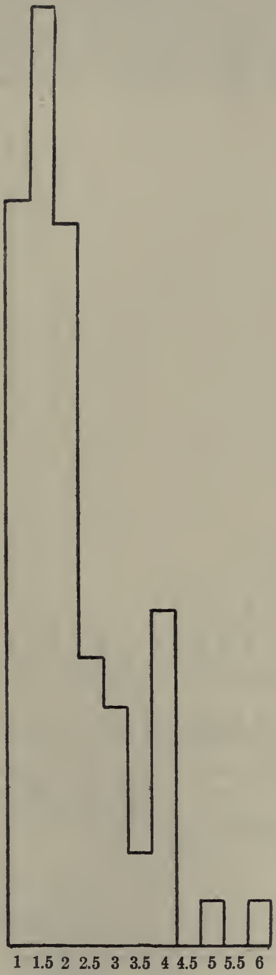

Fig. VII. Surface of frequency (half years) Walking.
144 Feeble-Minded Boys and Girls.

Tredgold (22) has made similar observations. He says (p. 90):

> "A similar retardation of physiological activity is seen with regard to dentition, speech, and walking. Inquiries show that a large proportion of aments do not cut their first or second teeth until some considerable time after the ordinary period. Many of them do not attempt to stand until their third year, and walking is correspondingly late. In many cases the child is four or five years old before it says a word."

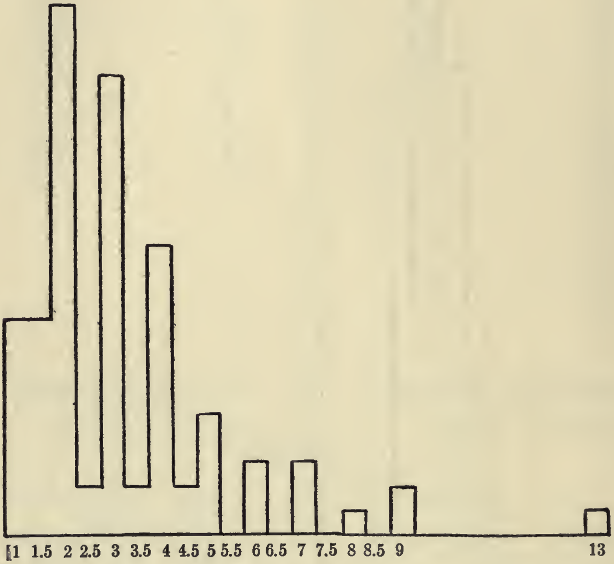

FIG. VIII. Surface of frequency (half years) Talking. 92 Feeble-Minded Boys and Girls.

In table form, the above findings and observations would be: letting I, represent normal children; II, "schoolable" feeble-minded children; III, "idiots":

	Number of Children	Age at Walking (Months)	Age at Talking (Months)
I.	50	13.54	15.8
II.	144—walking 92—talking	21.6	34.4
III.	111—walking 67—talking	30.0	51.0

Of the many articles in print on the development of speech in the child, the following from Preyer (13) p. 106 is perhaps as good a summary as may anywhere be found:

"The first thing with which the learning of speech begins is not, as was formerly assumed, the first cry of the newly born, for this can have no other significance than that of a reflex, like sneezing for instance. In fact, it often occurs that children announce their entrance into the world by a sneeze instead of a cry. But when strong impressions of various kinds have alternated with one another—when feelings such as hunger, pain, cold, on the one hand, and satiety, pleasure, warmth, on the other, have been discriminated, then crying acquires a speech significance, and the mood of the child may be perceived through the variations in his voice. . . . But all loud utterances of this sort that express bodily, and very soon also, mental states, are the farthest

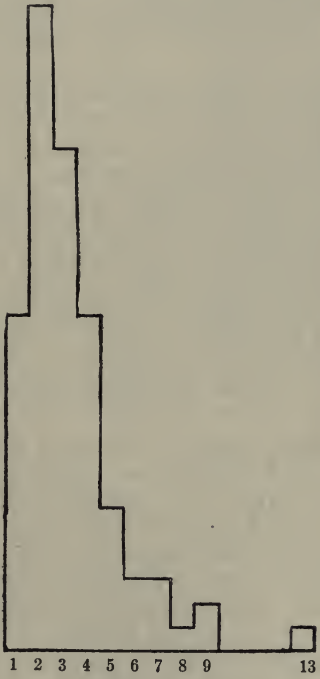

FIG. IX. Figure VIII "Smoothed"—Half years thrown, half and half, to the year.
92 Feeble-Minded Boys and Girls—Talking.

possible from being portions of an articulate language; rather are they completely analogous to the language of animals. Nor have those syllables the least claim to significance as language which are heard sometimes as early as the seventh or eighth week, . . . as ba, ma, am, ab, gö (etc.). These are produced, just as are the later sounds, . . . in the babbling monologues of the infant, by the movements of the vocal muscles, often through pure accident; and they have at the beginning no more psychogenetic significance than snoring, ...

" These utterances even in the third quarter of the first year are still almost wholly devoid of significance as language; but in the fourth quarter the character of them very often changes, and we may perceive that sounds uttered are influenced by the sounds heard from other persons, by words. With this is reached the critical point in the learning of language. That point is passed on the day when the child for the first time uses a word of verbal language independently and correctly."

That sensory impressions are prerequisite to audible expression there seems to be no question. That "ideas," translated into intelligent forms of expression, form the basis of speech in man there can be no dispute. That such ideas come slowly to the mentally deficient child we must admit. That speech is slow in such children, as a group, must be evident from the above findings. The individual exception may appear, but the fact seems apparent that, while in the individual, physical weakness or adenoid growth, or other malformation,[1] may be contributory causes to lateness in walking or talking, the general tendency of the deferred ripening of the walking and talking instincts, as shown in large groups of children, may well be a matter of grave concern. By the slow, and more seriously, the impaired, maturing of these instincts, stimuli of greatest educational value in the earlier months are withheld from the child. If general psychic activity be sluggish, proper functioning does not occur, and conscious associations are not so readily formed as in the healthy normal child. If the child has a motor or sensory defect, his inability to "break up" sensations leaves him the longer in mental darkness.

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[1] On the importance and effects of structural irregularities in the peripheral organs of speeech, with clinical cases given, see references 6, 7, 8, 9. The substance is, that mental retardation may be the result, as well as the cause, of defective or late speech. "Backwardness in children is not always due to a central lesion, but may be the result of arrested cerebral development due to some abnormality of structure in peripheral organs." (7) "Retarded development of speech always results in defective mentality." (8)

That the ability of the child to form ideas is the vital thing in learning to talk, we would see from Preyer (13) p. 89—"ideas are the necessary previous condition for the understanding of the first words learned, and therefore for learning to talk. If these ideas are wanting, the development of languages is not attained." This qualification however follows, p. 94—"no special activity of intellect is proved by the quick learning of speech. . . . On the contrary, excessive speaking argues less intelligence, because, of course, less time remains for thinking." Tracy (21) p. 131, would offer a similar observation. He says: "The wide differences among children make it unsafe to venture any generalizations; except one, viz., this second half year seems to be par excellence the period of the rise of imitation. Some children however, are as far advanced at the beginning of this period as others are at its end. Perhaps it ought also to be remarked that the child who shows a great precocity in imitation, or in learning to speak, will not necessarily on that account turn out a more intelligent child. Imitation does not require a very high degree of mental acuteness, and the child who has been slow in this may in the end surpass his more precocious companion."

While too much importance should not be attached to individual cases, and while normal children in themselves vary greatly in the time of learning to speak, the accomplishment of groups of children of differing degrees of intelligence is not a matter that can be lightly set aside. Man at present is more intelligent than primal man. He learns to utter the first intelligent word sooner than did his ancestors. Phylogeny was slow in speaking. Romanes in his "Mental Evolution in Man" (16) ch. 16, says: "Lastly, if we take the growing child as an index of psychogenesis in the race, there can be no doubt that it points to a comparatively late origin of the faculty of articulation. . . . For even a precocious child does not begin to make any considerable use of words as signs until it is well on into its second year, while usually this stage is not reached until the third." Four years in fact, we might infer from Romanes, is an age corresponding better to the phylogenetic acquisition of language. Does the feeble-minded child then more truly represent phylogeny, in the faculty of speech, than the healthy, normal child?

As a final summary of the "Age of Walking and Talking in Relation to General Intelligence," the following is submitted as the findings of this study:

I

Data

Fifty "normal" children (25 boys and 25 girls), averaging less than six years of age, of graduate students of Teachers College and Columbia College. Ages were thrown to the nearest month.

Walking means: "To take a step unassisted."

Talking means: "To use a word intelligently, i.e., to associate the idea with the object."

Results

The median "normal" child begins to walk at 13.54 months, with a probable error of 1.06 months. The chances are 999 to 1 that the true median will not differ from the median obtained by more than .72 months,—stated in another way, the chances are 999 out of 1,000 that the true median lies between 12.82 and 14.26 months; and 10 to 1 that it lies between 13.16 and 13.92 months. The extreme range is from 11 to 30 months. Ninety per cent of the cases fall between 11 and 17 months.

The median "normal" child begins to talk at 15.8 months, with a probable error of 2.83 months. The chances are 999 to 1 that the true median will not differ from the median obtained by more than 1.92 months,—stated in another way, the chances are 999 out of 1,000 that the true median lies between 13.88 and 17.72 months; and 10 to 1 that it lies between 14.8 and 16.8 months. The extreme range is from 9 to 25 months. Ninety per cent of the cases fall between 10 and 21 months, with 18 months as the mode.

II

Data

One hundred and forty-four "schoolable" children (boys and girls) of the Indiana School for Feeble-Minded Youth, in reply to the question on the personal descriptive entrance blanks: "At what age did the child commence to walk?" and 92 children in reply to the question: "At what age did the child commence to talk?"

Results

The median feeble-minded child begins to walk at 21.6 months, with a probable error of 7.56 months. The chances are 999 to 1 that the true median will not differ from the median obtained by more than 3 months,—stated in another way, the chances are 999 out of 1,000 that the true median lies between 18.6 and 24.6 months; and 10 to 1 that it lies between 20.03 and 23.18 months. The extreme range is from 12 to 72 months. Ninety per cent of the cases fall between 13 and 50 months.

The median feeble-minded child begins to talk at 34.44 months, with a probable error of 12.84 months. The chances are 999 to 1 that the true median will not differ from the median obtained by more than 6.43 months,—stated in another way, the chances are 999 out of 1,000 that the true median lies between 28.01 and 40.87 months; and 10 to 1 that it lies between 31.09 and 37.79 months. The extreme range is from 12 to 156 months (only one case going above 108 months). Ninety per cent of the cases fall between 14 and 84 months.

Children, in general, learn to walk before they learn to talk.

Boys, whether normal or feeble-minded, learn to walk and talk later than girls.

In decided cases of imbecility, children walk and talk later than in the less pronounced grade of mental defect.

The writer wishes to acknowledge his obligations to Professor Edward L. Thorndike for helpful suggestions, aid, and encouragement in this study.

BIBLIOGRAPHY

1. BARR, M. W. Mental Defectives. Philadelphia, 1904.
2. HALL, Mrs. W. S. First 500 Days of a Child's Life. Child Study Monthly, 1896-97, vol. 2, pp. 401-407, 467, 590-591.
3. IRELAND, Wm. W. Mental Affections of Children. Pp. 323-340. Philadelphia, 1900.
4. KIRKPATRICK, E. A. How Children Learn to Talk. Science, Sept. 25, 1891.
5. MACDOUGALL, ROBT. The Child's Speech. Jour. of Ed. Psy., vol. 3 and 4. 1912-13.
6. MAKUEN, H. The Training of Speech as a Factor in Mental Development. Bull. Amer. Acad. Med., Vol. 3, Oct., 1898.
7. MAKUEN, H. Speech as a Factor in the Diagnosis and Prognosis of Backwardness in Children. Jour. Amer. Med. Assoc., Oct. 12, 1901.
8. MAKUEN, H. Retarded Development of Speech in Young Children. Penn. Med. Jour., Vol. 8, June, 1905.
9. MAKUEN, H. The Essentials of Voice Production. N. Y. Med. Jour., Vol. 88, Sept., 1908.
10. MAJOR, D. R. First Steps in Mental Growth. Macmillan. 1906.
11. MEAD, C. D. The Age of Walking and Talking in Relation to General Intelligence. (Abstract of paper before the New York Branch of the Amer. Psy. Assoc.) Jour. of Phil. Psy. and Sc. Methods, Vol. 9, No. 14, pp. 379-380, July 4, 1912.

12. Pelsma, J. R. A Child's Vocabulary and Its Development. Ped. Sem., Vol. 17, 1910 (q. v. for bibliography on children's vocabularies).
13. Preyer, W. Mental Development in the Child. Trans. H. W. Brown. International Series. New York, 1893.
14. Preyer, W. The Senses and the Will. Part I of "The Mind of the Child." Trans. H. W. Brown. New York, 1888. (Observations concerning the first sitting, creeping, standing, walking, and running of his son.)
15. Preyer, W. The Development of the Intellect. Part II of "The Mind of the Child." Trans. H. W. Brown. New York, 1889. (Observations on the acquirement of speech by his son in 1877-78.)
16. Romanes, Geo. J. Mental Evolution in Man. New York, 1889.
17. Rowe, E. C. The Vocabulary of a Child at Four and Six Years of Age. Ped. Sem., June, 1913. (A list of words used by a child at 4 and 6 years of age. About 4,000 at 6 years.)
18. Seguin, Edward. Idiocy and Its Treatment by the Physiological Method. Pp. 41, 46, 74, 106. Teachers College Reprint, 1907.
19. Shinn, M. W. Notes on the Development of a Child. Univ. of California Studies. No. 1-2, 1893; No. 3-4, 1899.
20. Shuttleworth, G. E. Mentally Deficient Children. London and Philadelphia, 1900.
21. Tracy, Frederick. Psychology of Childhood, Ch. V. (q. v. for bibliography).
22. Tredgold, A. F. Mental Deficiency. London, 1908.
23. Trettien, A. W. Creeping and Walking. Amer. Jour. Psy., 1900, 12, 1-57.
24. Trettien, A. W. Psychology of the Language Interest of Children. Ped. Sem., Vol. 11, 1904.
25. Whipple, G. M. The Vocabulary of a Three Year Old Boy. Ped. Sem., Vol. 16, 1909 (q. v. for bibliography).

THREE HUNDRED FIFTY WHITE AND COLORED CHILDREN MEASURED BY THE BINET-SIMON MEASURING SCALE OF INTELLIGENCE: A COMPARATIVE STUDY

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As early as 1895, the French psychologist, Alfred Binet, had devised a series of tests to measure "personality." In 1904 the French government provided for the establishment of special classes for mentally defective children. To meet the practical demand thus created, the determination of which children were subnormal, Binet and his collaborator, Simon, published a series of thirty tests in 1905. These tests were tried on 203 school children of Paris. In 1908 they were revised and arranged on a graded scale. As a result of further experimentation, a second revision of the scale was issued in 1911.

The correlation between age and mental development is the principle upon which the Binet-Simon measuring scale of intelligence is based. The scale consists of a number of tasks and questions, arranged in a graded series of groups, each group corresponding to a given age. The purpose of the tests is to provide a standard of measurement, by means of which a child's intellectual development may be compared with that of the average normal child of his age. The tests are selected to measure native intelligence, influenced as little as possible by environment and training.

Psychologists in Europe and America are experimenting with both the 1908 and the 1911 series, rearranging the serial order, rejecting some tests, and supplementing the series with other tests. When it is perfected, such a series will be of inestimable value. In spite of its present imperfections, the scale is already being put to practical use. Where legal enactments require the segregation and special training of backward and defective children, as in the State of New Jersey (5), some standard is necessary to determine which children are sub-normal. The city of Philadelphia (4) has adopted the

Binet tests for this purpose. The tests are regularly applied in the New Jersey institution for the feeble-minded and defectives at Vineland, and in the Illinois institution at Lincoln.

Although the primary object in devising the tests was the determination of defective children, the need for such a standard is felt in dealing with normal children. To be able to tell with certainty which children in a school are backward, or normal, or endowed with more than average mental ability, cannot fail to result in increased efficiency in teaching.

Psychologists differ in their opinions as to the reliability of the Binet tests. This study, based on the application of the tests to two hundred twenty-five white children and one hundred twenty-five colored children, is offered as a slight contribution to the widespread experimentation now being made. Great help has been received from the articles on the subject by Goddard (30), Terman (57 and 58), Squire (53), Pyle (48 and 49), Ayres (7), Bell (9), Wallin (61), and others, particularly Town's translation of Binet and Simon (13). The purposes of this paper are:

1. To present the results obtained from testing the white children, and to compare the results with those of Dr. Goddard (30).
2. To make a comparative study of white and colored children as measured by the tests.
3. To arrive at some conclusions as to the reliability of the scale as a whole, and as to the serial arrangement of the tests.
4. To make some suggestions based on these conclusions.

Sources of Data and Conditions of the Study

This study was made under the supervision of Dr. Josiah Morse of the University of South Carolina. The writer acknowledges, with gratitude and appreciation, her indebtedness to Dr. Morse for his constant direction, his helpful and stimulating suggestions, and his unfailing kindness. The children were tested in the public schools of the city of Columbia, S. C. The securing of the data was made possible by the permission of the superintendent of the city public school system, and greatly facilitated by the co-operation of the principals and teachers. Four white schools, two of them in the heart of the city, one on the outskirts, and one in a cotton mill village, and one colored school were visited.

The effort was made to conform closely to the methods of Dr. Goddard (30), in order that the results might be compared with his. His 1911 Revision of the scale was used:

his method of procedure was followed in reckoning ages, in administering the tests, in calculating and tabulating results.

The work at one school was finished before another school was visited. The tests were always begun with the children of the lowest grade. The securing of a representative group of children was accomplished in two ways. First, among the white children, at least, the children taken from the two city schools represented a very different social environment from those of the other two schools. Secondly, the teachers were asked to select children of varying ability from the pedagogical standpoint. The teachers gave the examiner their estimates of the children, ranging from unsatisfactory to excellent, after the testing was over. The examiner, a stranger in the city, was thus enabled to conduct the test with no preconceived idea of the child's ability.

The children were interviewed privately, one at a time, in the principal's office or vacant hall. There was no difficulty in securing cordial relations with the children. They were always encouraged, and apparently always exerted themselves to do their best. They invariably responded with interest, if not with eagerness.

The physical age was reckoned by even years, that is, from birthday to birthday. The mental level was fixed at the age at which the child passed all, or all but one, of the tests for that year. He was then advanced a year for each five higher tests successfully passed, *e. g.*, a child who has his intellectual level fixed at seven years, but passes three of the eight year tests and two of the nine year tests, is advanced a year and credited with the mental age of eight. It is believed that the testing was thorough. If a child failed with the tests for his age, he was given the tests for lower ages until his mental level was established. In like manner each child was given the opportunity to pass all of the higher tests that he could.

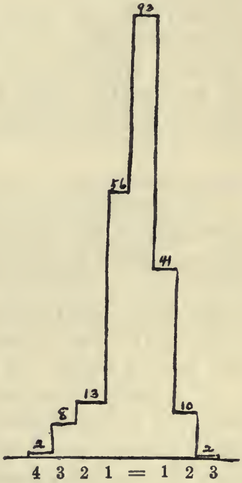
Dr. Goddard's directions were followed strictly. In a few instances the language of the question had to be adapted to the understanding of the child. It was found that the mill children were accustomed to the word "evening" not "afternoon" (VI, 1). The more familiar words "doctor" and "preacher" were substituted for "physician" and "clergyman" (XII, 5). In making change (IX, 1) the children saw the absurdity of giving two dimes in making a four cent purchase. After a few trials, therefore, a quarter was used instead. Some of the comprehension questions (X, 4) had to be explained. All of these slight changes were made with the approval of Dr. Morse. Dr. Goddard himself suggested that the five and ten dollar coins or bills (X, 1) be omitted.

Dr. Goddard's record blanks were used; the responses were marked + or —. It was not possible to have a second person keep a full record of all that the child did and said. The examiner kept in a separate note-book as many as possible of the answers to the definition, comparison, comprehension and problem questions.

Two Hundred Twenty-five White Children Tested

The children ranged in age from six to twelve years old. They were taken from the first seven grades of the school. The distribution curve shows the results. Those testing "at age" passed the tests for their respective ages, or a sufficient number of higher tests, if they failed on some of those for their ages.

Graph I.[1]



Number testing 4 years below age— 2.
" " 3 years below age— 8.
" " 2 years below age—13.
" " 1 year below age —56.
" " at age..........—93.
" " 1 year above age —41.
" " 2 years above age—10.
" " 3 years above age— 2.

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[1] In this and following graphs, numerals, at the various levels of the curves indicate numbers of pupils in the groups. Numerals beneath the base lines indicate as follows for each of the individual figures in the graphs: Equality sign signifies "at age;" numerals to the left of the equality sign signify the number of years below, those to the right of it the years above "age," at which the several groups stood according to the test.

Of the entire group of children, ninety-three or 41.3% test at age: (cf. Goddard for the same ages, 39.4%). Children who test either one year above or one year below age are counted with the central group as practically normal and satisfactory. With the method of reckoning physical age employed, any other proceeding would be manifestly unjust. In the summary of results given below, Dr. Goddard's figures are not his totals, but are computed from his group of children whose ages correspond to those of the Columbia children.

	Strong	Goddard
Number testing more than 1 year below age.....	23=10.2%	(15.5%)
Number practically normal and satisfactory....	190=84.4%	(80.7%)
Number testing more than 1 year above age....	12= 5.3%	(3.8%)

It is seen from this that by far the larger number tested are counted satisfactory, that about 5% are better endowed than the average child, and that about 10% are backward. Binet (13) says that no child should be considered mentally defective unless his mental retardation amounts to more than two years. According to this standard, 4.4% of the Columbia children tested are to be classed as defectives. It is also seen that the results do not vary greatly from Dr. Goddard's.

TABLE I.

Age	V.	VI.	VII.	VIII.	IX.	X.	XII.	XII.	Totals	Strong at Age	Goddard at Age
6 yrs.	7	**11**	15	3					36	31%	30%
7 "	1	4	**22**	9					36	61%	58%
8 "		1	4	**15**	4	1	2		27	56%	41%
9 "			2	8	**13**	4	4		31	42%	28%
10 "			2	4	10	**8**	3	2	29	27%	56%
11 "				2	3	4	**11**	6	26	42%	36%
12 "				2	4	2	19	**13**	40	32%	27%
Totals.	8	16	45	43	34	19	39	21	225	41%	39%

This table shows the distribution of the entire number of children in mental and physical age. (The Roman numerals stand for mental age, as determined by these tests. The Arabic numerals, when used to designate age, stand for physical or chronological age.) The heavy-faced figures show those testing "at age." For example, of the seven-year-old children, 22 tested at age, 4 tested VI, 1 tested V, and 9 tested VIII. To the right are given the percentages of children testing at age for each year, side by side with the corresponding figures of Dr. Goddard.

If the tests are so selected and graded as to constitute an exact standard of measurement, the largest group of normal children of each year should test at age. This is seen to be the case with the seven, eight, nine, and eleven-year-old groups. The largest group of six-year-old children test one year above age; the largest groups of ten and twelve-year-old children test one year below age. Dr. Goddard's table shows the same thing with the six and twelve-year-old groups. This would seem to indicate that the questions for seven years are too easy, and those for twelve years, perhaps for ten years, are too difficult.

An examination of the two columns to the right shows that the total number testing at age varies little from Dr. Goddard's; 41% and 39%; but that the proportion varies greatly from year to year. To quote from him (30, page 235): "To a person familiar with statistical methods the foregoing curve of itself, amounts to practically a mathematical demonstration of the accuracy of the tests. The results could not arrange themselves on this curve, which is recognized as practically a normal curve of distribution, if the questions were not carefully graded. Secondly, if they were not right, age for age, but were too hard or too easy, the largest group would not be one *at age,* but would be a year below or a year above according to whether they were too hard or too easy. Consequently, we are forced to the conclusion that the questions that Professors Binet and Simon have selected are well graded, at least from the ages of five to twelve, and that they fit the ages to which they are assigned."

With this conclusion we cannot agree. The tables of his paper, as well as of this, show that the largest group always fall under one of the three central divisions. The children of these three divisions are counted practically normal. The number of children tested is small, but it is believed to be a representative group. Therefore, we feel justified in drawing the following conclusions:

1. The tests are carefully graded, but they constitute an *approximate* and not an *exact* standard of measurement.
2. The scale is too easy for the seventh year, and too difficult for the tenth and twelfth years.

A tabulation of all the answers to each of the questions is the only correct basis by which to determine whether each test is properly placed in the scale. It is generally conceded that a test is properly placed if about 75% of the children trying it pass it successfully. Dr. Goddard drew up a table from the papers of those who tested at age, and decided from that what changes should be made in the serial order. If we were sure that those testing at age were exactly normal, and the only ones normal, this would be the proper test. It does not seem to us the best way, however, for the following reasons:

1. The method by which we reckon physical age prevents exactness. *E. g.*, a child who is six years and ten months old is counted a full year younger than a child who has just passed his seventh birthday.

2. The tests are evidently too hard or too easy for certain ages. *E. g.*, the largest group of twelve-year-old children test XI. We cannot tell from the smaller number testing XII which questions are too hard for that year. Those children may really be above normal, and the ones testing XI may really be the normal ones.

On the other hand, it seems unfair to draw conclusions from the responses of all the children taken at random. The answers of the subnormal or supernormal cannot be relied upon to settle this question. We, therefore, tabulated the responses of all the children of the three groups counted as practically normal. This gives a larger number of tests misplaced than would be found from using the papers of those who tested at age. The IV, V, and XV year tests were sometimes used. Since no children of any of these ages were tested, we can form no conclusion as to their proper place in the scale. The following tests were found to be misplaced because too hard for the ages to which they are assigned: VI; 1 3, 4:—VII; 2, 4;—VIII; 2, 4,—IX; 1, 2, 3, 5,—X; 2, 3, 5,—XI; 5,—XII; 3, 4, 5. The following are too easy: VII; 1, 3, 5,—VIII; 1,—X; 1,—XI; 3. Three of the seven-year tests are too easy, and three of both the ten and twelve-year tests are too hard. This confirms one of the conclusions drawn from the first table.

TABLE II. SECTION A.

Number in lower grade according to school standard	99=44.4%
Number in lower grade according to Binet scale	89=39.6%
Number in right grade according to school standard	121=53.8%
Number in right grade according to Binet scale	101=44.8%
Number in higher grade according to school standard	5= 2.2%
Number in higher grade according to Binet scale	27=12 %
Number below school age according to school standard	0
Number below school age according to Binet scale	8= 3.6%

It is not within the province of this paper to make any criticism either adverse or favorable, of the school system of

Columbia. It is interesting, however, to note to what extent the two systems of grading agree or differ. It is assumed that a six-year-old child should be in the first grade, a seven-year-old child in the advanced first grade, and so on.

TABLE II. SECTION B.

By Years of Retardation	1 Year	2 Years	3 Years	4 Years
Retarded according to the school system....	74	16	8	1
Retarded according to Binet scale..........	64	21	4	..
Backward according to Binet scale.........	56	13	8	2

It will be seen from this that the two systems do not agree. Following Dr. Goddard, we worked out a series of tables, analyzing this data to show the distribution of the children in the grades. We do not consider this data trustworthy for the following reasons:

1. The Binet scale is evidently to be relied upon only for approximate and not exact measurements.

2. The method of reckoning physical age precludes any accurate degree of comparison.

3. A pupil's pedagogical standing is determined only in part by his "native intelligence."

Although it is thought not worth while to include these tables (except one section, as an illustration) the results are given for what they may be worth.

TABLE III. SECTION A. THOSE TESTING AT AGE

AGE		GRADES							TOTALS				
Physical	Mental	1st	Ad 1st	2nd	3rd	4th	5th	6th	Number Tested	In Normal Grade	Number Retarded	Number Advanced	Below School Age
6 years.	VI	**11**	...	...	...	...	...	...	11	11	..	..	..
7 "	VII	7	**15**	...	...	...	...	...	22	15	7	..	..
8 "	VIII	1	2	**12**	...	...	...	...	15	12	3	..	..
9 "	IX	...	...	8	**5**	...	...	...	13	5	8	..	..
10 "	X	...	...	1	5	**2**	...	...	8	2	6	..	..
11 "	XI	...	...	...	2	3	**6**	...	11	6	5	..	..
12 "	XII	...	...	...	...	1	4	**8**	13	8	5	..	..
Totals......		19	17	21	12	6	10	8	93	59	34	..	..

This table shows the distribution of those who are the same age, physically and mentally. For example, of the 22 seven-year-old children who test VII, 7 are in the first grade and 15 are in the advanced first grade, the normal grade for them. The seven in the first grade are retarded according to both systems.

Similar tables were made to show the distribution in the grades of the children who are one, two, three, and four years backward, and one, two, and three years above normal. The summary of results is given.

TABLE III. SECTION B. SUMMARY

	Number Tested	Normal Grade	Number Retarded	Number Advanced	Below School Age
4 years backward.....	2	...	..	2	..
3 years backward.....	8	6	..	2	..
2 years backward.....	13	5	2	5	1
1 year backward......	56	28	3	18	7
At Age..............	93	59	34	..	..
1 year advanced......	41	3	38	..	..
2 years advanced.....	10	...	10	..	..
3 years advanced.....	2	...	2	..	..
Totals.............	225	101	89	27	8

The totals are the same as those given in Table II. The point of interest in this table lies in the analysis of the data. Those who are retarded are in a grade below what their mental ability (as measured by these tests) would warrant. Those who are advanced are in a grade above that for which they are mentally fitted. Seven six-year-old children, and one seven-year-old child test V. They are, therefore, below school age, mentally. Of the 93 who test at age, 59 are in their normal grade, 34 are in a grade lower than that for which they are fitted, and are marked retarded. Referring to Table III, Section A, we see that 29 of them are in a grade one year below, 5 are in a grade two years below their level. All of the children who are in a grade above their level test below age. Of the 53 children who test above age, only three are in the normal grade for them, and the other 50 are in a grade below their mental ability.

According to the estimates of the teachers, the children were divided into four classes: thirty-eight Poor, sixty-eight Fair, seventy Good, and forty-nine Excellent. Table IV shows the distribution of these four classes in the three divisions, those in the normal grade, those retarded, and those advanced.

TABLE IV.

	Normal Grade	Retarded	Advanced
Poor	23=22.7%	5= 5.6%	10=28.6%
Fair	33=32.6%	20=22.5%	15=42.8%
Good	35=34.6%	27=30.3%	8=22.9%
Excellent	10= 9.9%	37=41.5%	2= 5.7%

Of the 101 children in the normal grade mentally, the larger number do fair or good work, 22.7% do poor work, and 9.9% do excellent work. Of the children who are retarded, that is, of those who are mentally capable of being in a higher grade, a very small proportion do poor work, while the largest group of all do excellent work. This is what we should naturally expect. Again, of those who are in a grade above their ability, the largest number do poor work, a small number, good, and a very small number, excellent. This parallelism between the teachers' estimates and the Binet system of classifying is significant.

The next table shows the comparative grading of the boys and girls.

TABLE V. SECTION A.

	Below				At Age	Above		
	4 Yrs.	3 Yrs.	2 Yrs.	1 Yr.		1 Yr.	2 Yrs.	3 Yrs.
Girls	1	5	8	34	58	16	7	2
Boys	1	3	5	22	35	25	3	0

SECTION B.

	Girls	Boys
More than 1 year below age	14=10.7%	9= 9.6%
Satisfactory	108=82.4%	82=87.2%
More than 1 year above age	9= 6.9%	3= 3.2%

Characteristic Responses

The responses of the Columbia children, both the successes and failures, correspond to the specimen answers given by Binet (13), Wallin (61), Lawrence (41), and others.

YEAR VI

1. *Morning or afternoon.* Since a certain type of child will always choose the latter of two alternatives, the order was reversed if the question was asked in the afternoon. Not three-fourths of the six-year-old children were able to answer this.

2. *Definitions in terms of use.* Binet (13) states that the value of this test is great, in the use of language, in showing the idea which the child has formed of the object, the manner in which he has conceived it, the point of view which to him is most interesting. There were three types of response: 1st, silence, or simple repetition of the word, or gesture; 2nd, definition in terms of use only; 3rd, definition in terms superior to use. The majority of six-year-old children answered in terms of use. Examples of these responses are:

A fork; is to eat with; is to pick up ham and eat with.

A table; is to put things on; to write on; to eat on; numbers, like 2 × 2.

A Mamma: to cook things; buys your clothes; she loves you and feeds you; keeps you clean.

3. *Execution of a triple commission.* This proved to be too hard for this year. The task was always asked as a favor, and the children responded with evident pleasure. They were often conscious of failure. Binet (13) says that at five half succeed, and at six nearly all.

4. *Right hand; left ear.* Almost invariably the children extended the left hand before the word ear could be said. Occasionally there was hesitation and deliberation. Usually those who responded correctly did so as soon as they understood the directions.

5. *Esthetic comparison.* The pictures were exposed in pairs, a pretty and an ugly one, not always in the same order. Out of 32 responses there were only two failures.

YEAR VII

1. *Counting thirteen pennies.* This was found to be a good test to begin with. Any slight embarrassment of the child passed away with the action.

2. *Description of pictures.* There were two types of response: 1st, mere enumeration of objects, varying from the most prominent to minor details; 2nd, description, *e. g.,* I see a man driving two horses: his wagon is full of bags.

3. *Unfinished pictures.* While this test is too easy for the majority, the reactions to it varied greatly. Many were slow to understand that some of the pictures represented heads only. Others found it necessary to study the picture closely

for some minutes; and even after careful scrutiny, some failed to detect the omissions.

4. *Copying a diamond.* The children frequently had to be encouraged before they would attempt this. Dr. Goddard said that it should be drawn with a pen to make the test more difficult. Even with a pencil, we found it too hard for this age.

5. *Naming of four colors.* This test is not one of sense perception, but of naming the colors. The mistakes most frequently made were calling green, blue and calling blue, purple.

YEAR VIII

1. *Comparison of two objects from memory.* This tests the ability to think of two things at once, memory, observation, and discrimination. Differences of size, color, and use were most often noted, but other details were frequently mentioned. We give some of the typical answers.

A butterfly flies around and a fly flies on sticky paper. A butterfly sucks flowers and a fly doesn't. Flies are black, and butterflies are colored. Butterflies are larger than flies.

Wood is to burn; glass to put in houses, watches, clocks. You can drink out of glass, but not out of wood. You can see through glass, but not through wood. Wood won't break and glass will. Glass will cut you, and wood won't. Glass shines, and is slicker than wood.

You write on paper, sew things of cloth. Paper will tear before cloth will. Cloth's got pretty on it, and paper hastn't. Cloth, you make clothes out of, and you write on paper. You wrap up things in paper, but you sew cloth.

2. *Counting from 20 to 1.* There was frequently hesitation before the children could be encouraged to make the attempt. Occasionally where a child spoke slowly and deliberately, and did not pause long, credit was given although the time exceeded 20 seconds.

3. *Counting stamps. 1—1—1—2—2—2.* There were several methods of solution: 1—2—3—4—5—6; 1—2—3—5—7—9; 1—2—3—4, 5—6, 7—8, 9; or, "The first three cost three cents, and the last three cost six cents, nine cents in all. The first is the only wrong method.

4. *Repetition of five digits.* 4—7—3—9—5.

YEAR IX

1. *Making change.* This was entered into as a game, "playing store." The child was given several nickels and dimes, and at least eleven pennies (never enough to count out all of the change in pennies). The children were usually interested,

although the test is too hard. Various combinations, both correct and incorrect, were made. Those who failed were often unconscious of the fact.

2. *Definitions better than use.* The answers were counted superior to use if the child made some attempt to describe the object, or place it in a class, or noted the material. Examples:

A fork: Made of silver, with four prongs; A square long thing for a handle and three sharp points.

A table: A round piece of wood with four legs; Tables are of different kinds, one you eat on, one you turn trains on, and one is a counting table.

A horse: Bones and flesh and skin and blood; A big old animal; An old animal, has four legs and a bushy tail, you drive him.

A mamma: The one who makes our clothes; Right name for a mother; A person who owns a child and looks after it; She's got two arms, head, neck, body, two eyes, nose, etc.

3. *Knowing date.* This proved to be too difficult for the ninth year, although an error of two or three days was allowed. There were but few failures as to the month.

4. *Names of the Months.* One error was permitted.

5. *Arrangement of weights.* This appealed especially to the boys, who were quite willing to make more than one attempt. The greatest difficulty seemed to be with the three of lightest weight.

Year X

1. *Naming pieces of money.* The money was exposed on the desk, not in the regular order.

2. *Drawing designs from memory.* This proved to be too hard for the ten and eleven-year-old children. The number of the twelve-year-old children who tried it is too small to draw a conclusion from, but it is probably too hard for them. The two designs were exposed for 10 seconds, and then reproduced from memory. The children were allowed to see just how long 10 seconds is before the designs were shown in order that they might be better prepared. This tests attention, memory, and some analysis. We counted this satisfactory if both parts were recognizable, no account being taken of proportion, crookedness, or perspective.

3. *Repetition of six digits.* One success out of three trials was sufficient to pass this test.

4. *Comprehension questions.* This was counted satisfactory if two out of the first series, and three out of the last series were answered correctly. The last series is more diffi-

cult than the first. It was often hard to tell whether an answer should be considered satisfactory or not. We give some responses of both kinds. Exactly three-fourths of both the ten and eleven-year-old children passed this.

Late to school: Come right on; Hurry on; Cry; Stay after school—.

Taking part in an important affair: Think; Ask their mother; Don't know—Ought not to do it.

Excusing a wrong act committed in anger: Because they didn't know what they were doing when mad, almost like in a fit; When they are angry they don't do it right, and when they are not angry they do do it right; Because they might start to fighting.

Asked opinion of some one of whom he knows little: Ought to find out before telling; Tell what you know but say you did not know much; I'd say they're good because I don't know him; Say good morning or good evening; Say she's nice and pretty.

Judging by actions versus words: Because they might say good and sneak off and not do it, but you can see what they do; You can see what they do but you can't always believe what they say; Because they might talk good and act mean; Because they might be innocent and might be guilty; Because when they do well, we say they have sense; when they don't do well, people talk about them and say they haven't any sense at all—.

5. *Sentence containing three given words.* The words used were Columbia, money, and river. The answers were of three types. 1st, Three separate sentences; 2nd, Two ideas connected by a conjunction; 3rd, A single idea involving the three words. The last two are satisfactory.

YEAR XI

1. *Seeing absurdities in sentences.* Those who understood this entered into it as into a game, and were much amused. Others failed to grasp the idea. Specimen answers:

Unfortunate cyclist: Couldn't get well if he was already dead; Couldn't ride a bicycle if his head was broken; If he had a good doctor, he'd get well—.

Locked in a room: She'd be dead before she cut so many pieces; She didn't have anything to cut herself with—.

Suicide on Friday: Couldn't be bad luck after he was dead; Friday is a good day; There isn't any bad luck—.

2. *Three words in one sentence.* The same as X, 5.

3. *Sixty words in three minutes.* The number of words given varied from 60 to 130. While only the number given

counted, the manner of responding was significant. Some gave detached words, while others gave them in a series, different articles of dress, parts of a house, terms used in a lesson, articles of the same class, rhymes, etc. Some confined themselves almost exclusively to names of things in sight, or of things related to them. Few used abstract terms. Some who began rapidly soon exhausted themselves. Some repeated the same words several times, and others interrupted themselves to ask if the time was almost up.

4. *Rhymes.* The majority passed this. There were two forms of incorrect response that were interesting: words beginning with the same sound, as date to rhyme with day, milk with mill; words related in idea, as cotton to rhyme with mill.

5. *Dissected sentences.* The second sentence containing the word *have* caused the greatest difficulty.

YEAR XII

1. *Repetition of seven digits.* One success out of three trials was counted satisfactory.

2. *Abstract definitions.* The phraseology was considered immaterial if the definition contained the essential idea. Specimen answers:

Charity: Means giving to poor people; the kind of people you go with; To be nice and clean.

Justice: Means fair play; To give anybody their rights; A religious person.

3. *Repetition of a sentence containing 26 syllables.* Only three out of thirty-three were able to pass this.

4. *Resistance to suggestion.* This test is difficult. On the first three pages the second line is the longer, on the last three the lines are equal in length. The child, having said that the second line is the longer for three times, will continue to say that the second is the longer unless he "resists suggestion." Some who did "resist the suggestion" seemed unable to see that the lines on the last three pages were of equal length, but indicated first one and then the other as the longer. The question was always asked exactly according to directions. These responses were scored ± on the record sheet but were numbered among the failures in tabulating the results.

5. *Problems of various facts.* In addition to the correct responses, there were many incorrect answers given. To the first such answers as a branch, a snake, a bear, a monkey; to the second the following were given. Somebody is very

sick, the doctor has come to treat him, the lawyer to make his will, and the preacher to pray with him. The house is haunted. He is having a party.

It was sometimes necessary to use some of the fifteen year tests. The pictures used were not very suitable for interpretation. The changing of the clock hands proved interesting, but difficult. The naming of twenty words opposite in meaning is easy enough to be a twelve year test.

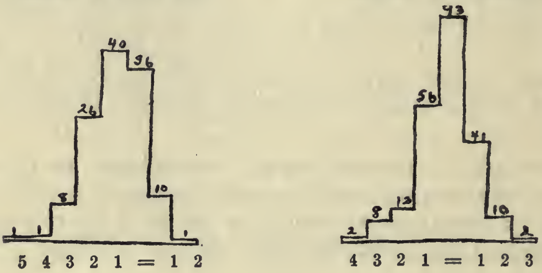
ONE HUNDRED TWENTY-FIVE COLORED CHILDREN TESTED: A COMPARATIVE STUDY

All of these tests were made at the Howard school, a part of the regular public school system of Columbia. The object in testing the colored children was not to determine the value or accuracy of the tests, but to make a comparative study of white and colored children. Even with an imperfect standard of measurement, the results obtained from giving the same tests under uniform conditions, are significant. The only respect in which the conditions vary is the testing of some colored children older than twelve years.

So far as the examiner could judge, the children felt at ease and did their best. It is quite possible, however, that an examiner of their own race might have obtained different results. Two of the children tested so irregularly that they could not be graded. One of them, an elevent-year-old boy, passed all of the six year tests, failed on all of the seven year tests, and succeeded with four of the eight year tests. These two records were not included in the tabulations which are given for the remaining one hundred twenty-three.

The distribution curve of the white children is here reproduced side by side with that of the colored children for the contrast. Since nearly twice as many white children were tested as colored, the curve for the whites is drawn to half the scale.

GRAPH II.



Section A. Colored.

Section B. White.

	Colored	White
Number testing 5 years below age	1	0
" " 4 years below age	1	2
" " 3 years below age	8	8
" " 2 years below age	26	13
" " 1 year below age	40=32.5%	56=24.9%
" " at age	36=29.2%	93=41.3%
" " 1 year above age	10= 8.1%	41=18.2%
" " 2 years above age	1	10
" " 3 years above age	0	2

The graph for the whites resembles closely that given by Dr. Goddard, but that for the colored is strikingly different. The number of white children testing at age is decidedly larger than any other group. The group of colored children testing one year below age is larger than that of those testing at age.

	Colored	White
More than one year backward	29.4%	10.2%
Satisfactory	69.8%	84.4%
More than one year advanced	0.08%	5.3%

This seems to lead to the conclusion that the colored children are mentally younger than the white. There is a difference of nearly 15% in the satisfactory group, nearly three times as many are more than a year backward, and less than 1% are more than a year advanced.

The course of study in the colored school is practically the same as that in the white schools. To what extent this difference is due to racial inferiority, to what extent to difference in the home environment, cannot be said. It is certainly not due to difference in school training. In order to make the comparison as just as possible, a comparative study was made of the city children, mill children, and colored children. There are only five grades in the mill school. Therefore only the corresponding grades of the other schools are considered in this comparison.

Graph III and Table VI show that the colored children make a better showing in these first five grades than they do in the first seven. They are still more backward than the whites, however. The proportion of colored children who are satisfactory is less than that of the mill children, which in turn is less than that of the city children. Less than 6% of the city children are more than a year backward, 18% of the mill children, and 26% of the colored children. None of either the mill or colored children test more than a year above age, while 10% of the city children do.

Professor Binet says:—"The researches which have enabled us to calculate our norms, were made in those primary schools of Paris which are situated in the poorer districts. Experience has demonstrated that the children of persons in easy circumstances present in general a higher intellectual development than that expressed by our means. Thus, in a private school, frequented by the bourgeoisie, and where the classes consist of from 8 to 10 pupils, the pupils show a mean, one and one-half years in advance of our normal means." (13, page 70.) The following curves seem to bear out this theory.

GRAPH III

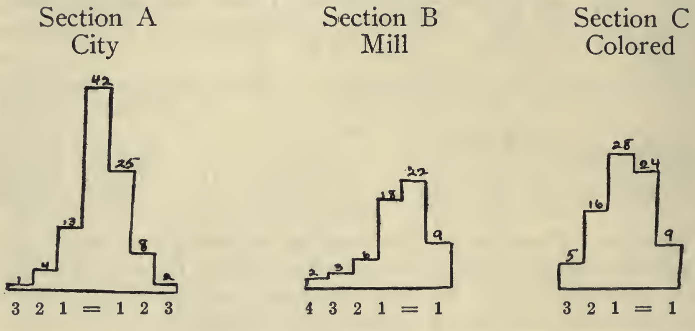


TABLE VI. SECTION A.

Number Testing	City	Mill	Colored
4 years below age.............	0	2= 3.3%	0
3 years below age.............	1= 1.1%	3= 5.0%	5= 6.1%
2 years below age.............	4= 4.2%	6=10.0%	16=19.5%
1 year below age.............	13=13.7%	18=30.0%	28=34.1%
At age.....................	42=44.2%	22=36.6%	24=29.3%
1 year above age.............	25=26.3%	9=15.6%	9=10.9%
2 years above age............	8= 8.4%	0	0
3 years above age............	2= 2.0%	0	0

TABLE VI. SECTION B.

Number Testing	City	Mill	Colored
More than 1 year backward...............	15.3%	18.3%	25.6%
Satisfactory............................	84.2%	81.6%	74.4%
More than 1 year advanced...............	10.4%	0	0

In order to see whether this relative inferiority exists throughout, or whether the children of the colored race are as well endowed in the first school years, the following table was made. The children from six to twelve years old, only, are included: consequently the totals for the colored children differ from those of other tables.

TABLE VII.

	BELOW AGE		AT AGE		ABOVE AGE	
	White	Colored	White	Colored	White	Colored
6 years.......	19.4%	40.0%	30.6%	33.3%	50.0%	26.7%
7 years.......	13.9%	29.4%	61.1%	58.8%	25.0%	11.8%
8 years.......	18.5%	23.0%	55.5%	38.5%	26.0%	38.5%
9 years.......	32.2%	71.4%	41.9%	21.4%	25.9%	7.2%
10 years.......	55.1%	75.0%	27.6%	12.5%	17.3%	12.5%
11 years.......	34.6%	43.7%	42.2%	50.0%	23.1%	6.3%
12 years.......	67.5%	77.0%	32.5%	23.0%	......	......
Totals.......	34.5%	51.4%	41.2%	33.9%	24.3%	14.7%

TABLE VIII.

Physical Age	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	Totals
5 years..	..	..	1	..	..	..	..	..	..	1
6 “ ..	1	5	5	4	..	..	..	..	..	15
7 “ ..	..	..	5	10	2	..	..	..	..	17
8 “ ..	..	..	3	5	5	..	..	..	..	13
9 “ ..	..	..	..	2	8	3	1	..	..	14
10 “ ..	..	..	..	2	7	3	2	1	1	16
11 “ ..	..	..	..	..	1	4	2	8	1	16
12 “ ..	..	..	..	..	..	1	..	9	3	13
13 “ ..	..	..	..	..	..	..	1	6	3	10
14 “ ..	..	..	..	..	..	..	1	3	3	7
15 “ ..	..	..	..	..	..	..	1	..	..	1
Totals..	1	5	14	23	23	11	8	27	11	123

Table VIII differs from the corresponding Table I for the white children in several respects:

1. The children tested ranged in age from 5 to 15 years instead of from 6 to 12.

2. There is greater irregularity, the largest group not always falling under one of the three central divisions.

3. There are relatively more backward children.

4. The number of those testing above age is conspicuously small.

5. A larger number test one year below age than at age.

Two who tested XII passed also some of the fifteen year tests. It is quite possible that they might have made a better showing if there were tests for the years XIII and XIV. The table shows that more of the thirteen- and fourteen-year-old children tested below XII than tested at XII. It is equally probable that some of the eleven- and twelve-year-old white children might have been able to pass successfully XIII and XIV tests. Several of them passed some of the XV tests.

We conclude:

1. That the colored children are mentally younger than the white children of corresponding ages.
2. That the colored children test more irregularly than the whites.

It is quite possible that different results might have been obtained had a larger number of children been tested. The teachers selected pupils of varying ability in order that the number tested might be considered representative of the whole.

As with the whites, the comparison with the school standards is considered significant but not trustworthy. It is given for what it may be worth.

Table IX.

	Colored	White
In lower grade according to school standard......	54=43.9%	44.4%
In lower grade according to Binet scale..........	19=15.4%	39.6%
In right grade according to school standard......	59=48.0%	53.8%
In right grade according to Binet scale..........	55=44.7%	44.8%
In higher grade according to school standard.....	9= 7.3%	2.2%
In higher grade according to Binet scale.........	43=35.0%	12.0%
Below school age according to school standard....	1= 0.8%	......
Below school age according to Binet scale........	6= 4.9%	3.6%

Table X.

	Number Tested	Normal Grade	Number Retarded	Number Advanced	Below School Age
5 years backward....	1	..	..	1	..
4 years backward....	1	..	..	1	..
3 years backward....	8	..	2	6	..
2 years backward....	26	10	2	13	1
1 year backward.....	40	15	2	18	5
At age..............	36	26	6	4	..
1 year advanced.....	10	4	6	..	..
2 years advanced.....	1	..	1	..	..
Totals............	123	55	19	43	6

According to the Binet scale, a larger number of white children are in a grade below their mental ability than above. Table IX shows that the reverse is true with the colored children; 19 are retarded and 49 (counting those who are below school age) are advanced beyond the level of their intelligence. The analysis of the data gives the following table.

The correct or incorrect placing of a test in the series was determined in the same manner as before, upon a tabulation of the successes and failures of those who did vary more than a year from the normal. The purpose of this was not to discover needed changes in the serial arrangement, but to see whether the difficulties were the same for both races. The following tests were found to be too hard: VI; 1, 4, 5;—VII; 2, 4;—VIII; 4;—IX; 1, 2, 4, 5;—X; 2, 4, 5;—XI; 5;—XII; 3, 4, 5. All except three of these, VI; 5, IX; 4, and X; 4 were found to be too hard for the whites. The following proved to be too easy: VII; 1,—VIII; 1, 3, 5;—X; 1;—XII; 1, 2. It must be borne in mind that the number of colored children tested was much smaller than that of the white: quite different results might have been obtained from testing a large number.

The examiner could not note any marked variation from the white children in the manner of responding. In almost every case, the dress, cleanliness, and manners of the children indicated that they came from good homes. The replies were usually couched in fewer words than those of the white children. There was less tendency to enter into conversation. It was soon found that they were more at least when reacting to the tests than when an attempt was made to talk with them about other things. This may have been due to the fact that the examiner was of another race.

They found the picture tests difficult. Although the majority succeeded in detecting the omissions to the pictures, it was usually after long scrutiny. The failure to choose the prettier picture may have been due to different standards of beauty for the race. The attempt to describe the pictures often resulted in a bare enumeration of objects. The tests relating to time and money, distinguishing between morning and afternoon, enumerating the months, counting stamps, and making change, gave trouble. The drawing tests, both copying and reproducing from memory, were too hard. The answer to the questions of comprehension, to the absurd statements, and to the problems of various facts were sometimes absurd or senseless; the best replies, however, compare very favorably with those of the white children. The definitions were often not better than terms of use, and frequently stated in the language of a younger child. The comparison of two remembered objects sometimes noted points of difference not mentioned by the whites. Examples; Flies bring germs and butterflies do not. Flies get in things to eat and butterflies do not. A butterfly flies out only in the summertime and a fly all the time.

The children were divided into three groups according to color. This classification was not a scientific one and the statement of results may be entirely worthless. There were 34 dark children, 45 medium in color, and 43 light colored in this classification, 122 in all. Of the dark colored, 14.4% tested below age, 76.7% tested at age, and 8.8%, above age. Of the next group, somewhat lighter in color, 31.1% tested below age, 62.2%, at age, and 6.6% above age. Of the lightest group, 44.2% tested below age, 44.2% at age, and 11.6% above age. The darkest children are more nearly normal, the lightest show the greatest variation, both above and below normal.

Conclusions Reached as to the Reliability of the Binet Tests as a Whole, and as to the Serial Arrangement

In spite of variations in detail, the results obtained from testing the white children of Columbia compare favorably with those obtained by Goddard from testing a much larger number. To summarize briefly the conclusions already stated in this paper:

1. The Binet tests are based on the correct principle.
2. The tests are so graded that the results approximate accuracy.
3. Many of the tests are misplaced in the series.
4. While the Binet scale and school standard do not agree, neither system can be judged by the other. There is, moreover, an approximate parallelism between the findings of the scale and the estimates of the teachers.
5. The children of the mill village are inferior mentally to the children of the city.
6. The colored children are mentally younger than the white children.

From the foregoing considerations, taken in connection with recent criticisms of the tests, we arrive at the following conclusions:

I. As to the reliability of the tests as a whole:

1. The scale is based on the right principle. If it were not, the largest group would not always include the prac-

tically normal only. Ayres (7) thinks that this arrangement of the tests on an age scale constitutes the feature of greatest value in the Binet-Simon series, and that it is so important a contribution that its excellence outweighs the shortcomings of the tests themselves.

2. While the tests cannot be relied upon as accurate, they do approximate accuracy. This again is based on the fact that the three central groups are by far the largest. It is confirmed somewhat by the teachers' estimates. Huey (35) considers it the most usable "ready-made" scale available. The *Psychological Bulletin,* February, 1913, contains the reports of two retestings. Goddard reports that 464 children have had three annual testings with the following results; 49% made normal or more than normal progress, 47.2% made approximately one-half of normal progress, 1.25% made no progress, and 2.25% retrograded one or more points. These results he considers indicative of the reliability of the scale. Berry reports that 42 school children in Michigan were tested in 1911 and in 1912 with the following results. The average gain for those testing below age was 96% of a year, for those testing at age, 102% of a year, and for those testing above age, 117% of a year. This shows a close correlation with the results of the original tests; the average gain of those testing above age was 20% greater than that of those testing below age in 1911.

3. In spite of the obvious merits of the scale, we think the following criticisms, in addition to the frequent displacement up and down the scale, are just. There are certain defects which make the scale not wholly reliable.

(1) The method of reckoning age is not sufficiently exact. For example, a child who is 8 years and 10 months old is counted one year younger than a child who is barely 9, and one year older than a child who is just 7.

(2) Some of the tests are not independent of recent environmental experience. This criticism is made by several experimenters, including Ayres (7), Decroly and Degand (21), and Squire (53).

(3) There is no common plan running through the successive years. Consequently the results are not comparable from year to year.

(4) The tests assume that all children develop mentally in a regular and uniform manner. In regard to this point, Wallin says: "Just as native capacity differs with individuals, so will the capacity to acquire differ with individuals; but there is probably a certain rate of acquisition which is fairly normal in a given order of civilization, so that it is possible

to establish norms which hold for the great mass of average or typical individuals." (Human Efficiency. *Ped. Sem.*, 18, 1911, 80.)

(5) It is thought by some experimenters that they are too limited in extent.

(6) They are inadequate for the determination of the older ages of intelligence.

Notwithstanding these defects we think that the Binet-Simon scale is fundamentally correct, and that it points the way to greater possibilities.

II. As to serial arrangement:

As stated above, we found many of the tests misplaced in the series. The table below shows the order of the tests as determined by this testing of 225 Columbia children, compared with that of Goddard (30), Binet (13), and Terman and Childs (58). The tests are given as arranged in Goddard's revision; the first column shows the changes he thinks advisable. The second column gives the ranking of Binet (1911), the third column gives that of Terman and Childs, and the fourth gives our own. There was not uniformity of method in determining the place a test should occupy in the series; hence the results are not strictly comparable.

The table compiled by Bell (9) from the reports of Binet, and Levistre and Morle in France, Johnston in England, Goddard, and Terman and Childs in America, and Bobertag in Germany, reveals even greater discrepancies, a variation of three years in a number of instances. Since the majority of the tests are not influenced by environment and training, these variations can be accounted for only in part by differences in children in different countries, or in different sections of the same country. They must be due in part to the different methods of evaluating responses on the part of the different investigators, and in part to the lack of uniformity and standardization of the tests. As an example of the latter; Goddard considers the drawing two designs from memory (X.2) satisfactory if both designs are recognizable; Binet, if one is correct and one-half of the other; Terman exposes each one separately for five seconds.

TABLE XI.

	Goddard	Binet	Terman and Childs	Strong
SIX YEARS.				
1. Knowing morning or afternoon.	....	VI	V	VII
2. Definitions in terms of use....	Too hard	VI	IV	VI
3. Execution of a triple commission	....	VII	V	VII
4. Right hand; left ear..........	....	VII	VI	VII
5. Elementary esthetic judgment.	....	VI	IV	VI
SEVEN YEARS.				
1. Counting thirteen pennies.....	....	VI	VI	VI
2. Describing pictures...........	....	VII	VII	VIII
3. Indicating omissions in pictures....................	....	VIII	VII	VI
4. Copying diamond............	....	VI	VII	VIII
5. Recognizing four colors.......	....	VII	V	VI
EIGHT YEARS.				
1. Comparing two objects from memory..................	Too hard	VIII	VIII	VI
2. Counting backward from 20 to 1	....	VIII	VIII	IX
3. Enumerating days of the week.	Too easy	....	....	VIII
4. Counting stamps 1-1-1-2-2-2...	....	VII	IX	IX
5. Repeating five digits..........	Too hard	VIII	VIII	VIII
NINE YEARS.				
1. Making change..............	....	IX	X	XI
2. Definitions superior to use.....	Too easy	IX	....	X
3. Knowing date................	Too hard	VIII	IX	X
4. Enumerating the months......	....	IX	....	IX
5. Arrangement of weights.......	....	X	IX	X
TEN YEARS.				
1. Recognizing pieces of money...	Too easy	IX	....	VII
2. Drawing designs from memory.	Too easy	X	X	XI or XII
3. Repeating six digits..........	....	....	X	XI
4. Questions of comprehension:				
Series 1..................	....	IX	IX	X
Series 2..................	....	X	XI	X
5. Using three given words in a sentence..................	....	XI	X	XI
ELEVEN YEARS.				
1. Seeing absurdities...........	....	X	XII	XI
2. Using three given words in sentence..................	....	XI	XI	XI
3. Giving 60 words in three minutes.....................	....	XII	....	VII or VIII
4. Rhymes.....................	....	XV	....	XI
5. Dissected sentences...........	....	XII	XII	XII

TABLE XI.—Continued

	Goddard	Binet	Terman and Childs	Strong
TWELVE YEARS.				
1. Repeating seven digits........	....	XV	XIII	XII
2. Definitions of abstract terms...	Too easy	XII	....	XII
3. Repeating 26 syllables........	Too hard	XV	XII	Too hard
4. Resistance to suggestion......	....	XII	XII	Too hard
5. Solution of problems..........	....	XV	XIII	Too hard
FIFTEEN YEARS.				
1. Interpreting pictures..........	....	XV	XV	....
2. Changing clock hands.........	....	....	XV	....
3. Code—"Come quickly".......	....	....	XV	....
4. Opposites of 20 words........	....	....	....	XII

SOME SUGGESTIONS BASED ON THE CONCLUSIONS REACHED

In the light of the foregoing considerations, we venture to make several tentative suggestions as to ways in which the scale may be improved.

1. If the present scale is to be made exact, changes must be made in the serial order. The scale needs to be more thoroughly standardized. There should be tests provided for the years from twelve to fifteen. The method of reckoning ages would more nearly approximate accuracy if counted from half year to half year. We have tried no supplementary tests, but we think the addition of other tests, such as those used by Fernald and Healy in the Chicago Juvenile Court, and by Terman and Childs in California, would make the scale far more efficient.

2. We think it might be more advisable to use Binet's principle for an entirely new set of tests. Huey (35) says we have here the right " idea " for the construction of a still better scale. Dr. Carrie Ransom Squire has devised another set of tests. To quote from her (53) :—" The (Binet) tests for the different ages are not comparable; at one age certain specific mental capacities and at another stage entirely different capacities are tested. If we agree with Galton that the capacity of man can best be measured by " sinking shafts at a few critical points ", these critical points should first be chosen and the shafts sunk at corresponding points for the different stages of development. The failure to do this seems to be the most salient weakness of the Binet-Simon tests.

What are the "critical points" at which we must sink our shafts if we are to estimate mental efficiency correctly. . . . Most will agree that some of the most significant factors in the determination of mental efficiency are degree of attention, keenness of perception, ability to discriminate and assimilate—in other words, ability to comprehend a situation—memory span, strength of associative connections (conditioning the rapidity and accuracy with which old associates may be recalled, as well as that ability to form new associates, which is commonly called ability to learn), constructive or inventive power and, finally, judgment." Pyle (48) says:—"We should plan a series of tests for determining the degree of development of logical memory, rote memory, attention, imagination, association, and two aspects of mind more complex, learning capacity, and reasoning."

These two suggestions seem to us well worth consideration. It would be helpful to a teacher to know that a pupil is above or below normal, mentally. It would be infinitely more helpful to know in just what respects he is advanced or backward, whether memory, or association, or imagination, or reasoning.

3. Whether the present system of tests is perfected, or an entirely new one adopted, substitute tests should be provided. If they are used to any extent in the public schools, they will soon become well known by the pupils.

4. The mental tests should be accompanied by a physiological examination. Whipple calls attention to the need of experimental and statistical study of the correlation of chronological, pedagogical, psychological, and physiological ages. (*Journal of Educational Psychology,* September, 1912.) Baldwin says that every child has five interrelated ages, chronological, mental, physiological, school standing, and moral or religious; and that these ages may or may not correspond in their stages of development. (*Psychological Bulletin,* May, 1913.) Terman (58) says that mental retardation may sometimes be temporary rather than permanent. For example, a child who is twelve years old chronologically, may be only ten years old physiologically, and may finally reach a normal, if late, maturity.

5. Finally, the imperative need is *uniformity;* uniformity in the choice of tests, in serial arrangement, in administration of the tests, in tabulation of the results. We agree with Terman that no series of tests can claim more than a rough approximation to accuracy until it has been given a painstaking tryout with many hundreds of children under widely-varying conditions of culture and training. At present, there are wide variations in all of the particulars just enumerated, even among

those who advocate the use of the Binet scale. Goddard has revised Binet, and Huey has modified Goddard. Terman has added many supplementary tests. Wallin thinks the experimentation should be based on the 1908 series. This suggestion seems to us feasible: that the American Psychological Association appoint a committee to devise a series of tests (including substitutes), with detailed instructions for their administration. In this way a widespread experimentation could be conducted under uniform conditions and the reliability of the tests established.

BIBLIOGRAPHY

[NOTE.—Many of the references given below are taken from the list given by Prof. Frank N. Freeman in the *Psychological Bulletin,* July 15, 1913.]

1. (Anon.) The De Moor Size-Weight Illusion. Training School, 1912, 9, 145-148.
2. (Anon.) Binet Scale Notes. Training School, 1913, 10, 44-45.
3. (Anon.) The De Sanctis Tests. Training School, 1913, 10, 34-36.
4. (Anon.) Report of the Committee on Backward Children Investigation. Bulletin of the Board of Public Instruction, First School District of Pennsylvania, 1910.
5. (Anon.) The Treatment of Sub-normal Children. Bulletin of the Department of Education. New Jersey, 1912.
6. ASH, I. E. The Correlates and Conditions of Mental Inertia. Ped. Sem., 1913, 19, 425-437.
7. AYRES, L. P. The Binet-Simon Measuring Scale for Intelligence: Some Criticisms and Suggestions. Psychol. Clinic, 1911, 5, 187-196.
8. AYRES, L. P. Psychological Tests in Vocational Guidance. J. of Educ. Psychol., 1913, 4, 232-237.
9. BELL, J. C. Recent Literature on the Binet Tests. (A Review.) J. of Educ. Psychol., 1913, 3, 101-109.
10. BERRY, C. S. A Comparison of the Binet Tests of 1908 and 1911. J. of Educ. Psychol., 1912, 3, 444-451.
11. BINET, A., et SIMON, T. Nouvelles recherches sur la mesure du niveau intellectuel chez les enfants d'ecole. Année Psychol., 1911, 17, 145-201.
12. BINET, A., et SIMON, T. Le development de l'intelligence chez les enfants. Année Psychol., 1908, 14, 1-94.
13. BINET, A., and SIMON, T. A Method of Measuring the Development of the Intelligence of Young Children. Preface and translation by Clara H. Town. Lincoln, Ill.: Courier Co., 1912. 2nd Edition changed in form, 1913.
14. BLOCK, E., and PREISS, A. Ueber Intelligenzprüfungen an normalen Volkschulkindern nach Bobertag. Zsch. f. angew. Psychol., 1912, 6, 539-547.
15. BOBERTAG, O. Ueber Intelligenzprüfungen (nach der Methode von Binet und Simon). Zsch. f. angew. Psychol., 1911, 5, 105-203.
16. BOBERTAG, O. Ueber Intelligenzprüfungen (nach der Methode von Binet und Simon). Zsch. f. angew. Psychol., 1912, 6, 495-538.

17. Bobertag, O. Quelques reflexions méthodolgiques à propos de l'échelle metrique de l'intelligence de Binet-Simon. L'Année Psychol., 1912, 18, 271-287.
18. Calfee, Marguerite. College Freshmen and Four General Intelligence Tests. J. of Educ. Psychol., 1913, 4, 223-231.
19. Chotzen, F. Die Intellitenzprüfungsmethode von Binet-Simon bei Schwachsinnigen Kindern. Zsch. f. angew. Psychol., 1912, 6, 411-494.
20. Courtis, S. A. The Reliability of Single Measurements with Standard Tests. Elem. Sch. Teacher, 1913, 13, 326-345, 486-504.
21. Decroley, O., et Degand (Mlle.) J. La mesure de l'intelligence chez des enfants normeux d'apres les tests de MM. Binet et Simon. Archives de Psychol., 1910, 9, 81-108.
22. Descoeudres, Alice. Les tests de Binet et Simon et leur valeur scolaire. Archives de Psychol., 1911, 10, 331-350.
23. DeSanctis, S. Mental Development and the Measurement of Intelligence. J. of Educ. Psychol., 1913, 4, 61-70.
24. DeSanctis, S. Reattivi per la misura dell' insufficienza mentale. Contributi psicologici, 1912, I, pp. 16.
25. Fernald, G. G. An Achievement Capacity Test. J. of Educ. Psychol., 1912, 3, 331-336.
26. Fernald, G. G. The Defective Delinquent Class Differentiating Tests. Amer. J. of Insan., 1912, 68, 523-594.
27. Francia, G., and Ferreri, G. C. L'esame di psicologico semmario dei deficenti. Riv. di psicol., 1912, 270-288.
28. Franz, S. I. Handbook of Mental Examination Methods. (Nerv. and Ment. Dis. Monog. Series, No. 10.) New York: J. of Nerv. and Ment. Dis. Pub. Co., 1912, pp. 165.
29. Goddard, H. H. Four Hundred Feebleminded Children Classified by the Binet Scale. Ped Sem., 1910, 17, 387-397.
30. Goddard, H. H. Two Thousand Normal Children Measured by the Binet-Simon Measuring Scale of Intelligence. Ped. Sem., 1911, 18, 232-259.
31. Goddard, H. H. Echelle métrique de l'intelligence. Résultats obtenus en Amérique, à Vineland. Année Psychol., 1912, 18, 288-326.
32. Goddard, H. H. The Binet Tests and the Inexperienced Teacher. Training School, 1913, 10, 9-11.
33. Goddard, H. H. The Form Board as a Measure of Intellectual Development in Children. Training School, 1912, 9, 49-52.
34. Gray, C. T. A New Form of Substitution Test. J. of Educ. Psychol., 1913, 4, 293-297.
35. Huey, E. B. The Binet Scale for Measuring Intelligence and Retardation. J. of Educ. Psychol., 1910, I, 435-444.
36. Huey, E. B. Backward and Feebleminded Children. Clinical Studies in the Psychology of Defectives, with a Syllabus for the Clinical Examination and Testing of Children. Warick and York, 1912, pp. 221.
37. Johnson, R. H., and Gregg, J. McI. Three New Psychometric Tests. Ped. Sem., 1912, 19. 201-203
38 Johnston, Katherine L. M. Binet's Method for the Measurement of Intelligence; Some Results. J. of Exper. Pedagogy and Training College Record, 1911, I.
39. Kuhlman, F. A Revision of the Binet-Simon System for Measuring the Intelligence of Children. (No. I of Monog. Supp. of J. of Psycho.-Asthenics.) Fairbault, Minn., 1912. Pp. 41.

40. Kuhlman, F. The Results of Grading Thirteen Hundred Feeble-minded Children with the Binet-Simon Tests. J. of Educ. Psychol., 1913, 4, 261-268.
41. Lawrence, Isabel. A Study of the Binet Definition Tests. Psychol. Clinic, 1912, 5, 207-216.
42. Lobsien, M. Die experimentelle Ermüdungsforschung. II. Kapitel, Die Methoden der Ermudüngsmessungen. Zsch. f. Kinderforsch., 1913, 18, 201-212, 248-258, 305-312.
43. Meumann, E. Anleitung zu praktischen Arbeiten in der Jugendkunde u. experimentellen Pädagogik. Aufgaben zur Intelligenzprüfungen. Zsch. f. päd. Psychol. u. exp. Päd., 1912, 13, 623-638.
44. Meumann, E. Ueber eine neue Methode der Intelligenzprüfung und uber der Wert der Kombinationsmethode. Zsch. f. päd. Psychol., 1912, 13, 145-163.
45. Munsterberg, H. Psychology and Industrial Efficiency. Particularly chapters VIII.-X. Boston: Houghton, Mifflin Co., 1913.
46. Myers, C. S. Die Gefahren der "Mental Tests." Zsch. f. angew. Psychol., 1912, 6, 60-65.
47. Potts, W. A. Tests of Intelligence. Brit. Med. Jour., 1912, I, 880-883.
48. Pyle, W. H. A Suggestion for the Improvement and Extension of Graded Mental Tests. J. of Educ. Psychol., 1912, 3, 61-75.
49. Pyle, W. H. Standards of Mental Efficiency. J. of Educ. Psychol., 1913, 4, 61-70.
50. Saffiotti, U. L'échelle métrique de l'intelligence modifée selon la méthode Trèves-Saffiotti. Année Psychol., 1912, 18, 327-340.
51. Schmitt, C. The Binet-Simon Tests of Mental Ability. Discussion and Criticism. Ped. Sem., 1912, 19, 186-200.
52. Simpson, B. R. Correlations of Mental Abilities. New York: Teachers College, Columbia University, 1912.
53. Squire, Carrie Ransom. Graded Mental Tests. J. of Educ. Psychol., 1912, 3, 360-380, 430-443, 493-506.
54. Stern, W. Die psychologischen Methoden der Intelligenzprüfung. Leipsig: Barth, 1912.
55. Sullivan, W. C. Feeblemindedness and the Measurement of the Intelligence by the Method of Binet and Simon. Lancet, 1912, 182, 770-780.
56. Sullivan, W. C. La mesure du développement intellectuel chez les jeunes délinquantes. L'Année Psychol., 1912, 18, 341-461.
57. Terman, L. M. The Binet-Simon Measuring Scale for Measuring Intelligence: Some Impressions Gained by Its Application. Psychol. Clinic, 1912, 5, 199-206.
58. Terman, L. M., and Childs, H. G. A Tentative Revision and Extension of the Binet-Simon Measuring Scale of Intelligence. J. of Educ. Psychol., 1912, 3, 61-74, 133-143, 198-208, 277-289.
59. Thorndike, E. L. Educational Diagnosis. Science, 1913, 37, 133-141.
60. Town, Clara H. The Binet-Simon Scale and the Psychologist. Psychol. Clinic, 1912, 5, 239-244.
61. Wallin, J. E. W. A Practical Guide for the Administration of the Binet-Simon Scale for Measuring Intelligence. Psychol. Clinic, 1912, 5, 217-238.

62. WALLIN, J. E. W. Eight Months of Psycho Clinical Research at the New Jersey State Village for Epileptics, with Some Results from the Binet-Simon Testing. "Epilepsia," 1912, 3, 366-380.
63. WALLIN, J. E. W. Experimental Oral Orthogenics: An Experimental Investigation of the Effects of Mental Treatment on Mental Efficiency. J. of Educ. Phil., Psychol., etc., 1912, 9, 290-298.
64. WALLIN, J. E. W. Experimental Studies of Mental Defectives, etc. (No. 7 of Educ. Psychol. Monog., edited by G. M. Whipple.) Baltimore: Warick and York, 1912.
65. WALLIN, J. E. W. The Present Status of the Binet-Simon Graded Tests of Intelligence. Alienist and Neur., 1912, 33, 162-173.
66. WEINTROB, J. and R. The Influence of Environment on Mental Ability as Shown by the Binet-Simon Tests. J. of Educ. Psychol., 1912, 3, 577-583.
67. WHIPPLE, G. M. Manual of Physical and Mental Tests. Baltimore, Warick and York, 1910. Pp. 534.

PRACTICE IN THE CASE OF TYPEWRITING

By L. B. Hill, A. E. Rejall, and E. L. Thorndike

In 1907-1908 Mr. Hill and Mr. Rejall learned to typewrite under experimental conditions, and kept careful records of the work done daily, the errors made, and the conditions under which the work was done. These original measures have been analyzed and organized by Mr. Thorndike with results as shown in this article. He alone is responsible for the methods used and for any errors of computation apart from the original records.

The purpose of this report is to state certain facts concerning the amount, rate, limit, changes in rate, conditions, and permanence of improvement in the case (1) of typewriting one same 100-word paragraph and (2) of copying a page of approximately 300 words of changing material.

The original measures are given in full in Table I. It should be noted that since the daily task was to copy a constant amount, the daily time given to practice decreased as the experiment progressed. It should also be noted that the improvement in writing the same paragraph and in copying changing material is, in the case of either one, due to practice in both.

The Amount and Rate of Improvement

On the first day Hill copied the 100-word paragraph at a rate of 10 words per minute with 13 errors per hundred words, and copied the 300-word page at a rate of 7.1 words per minute with 19 errors per hundred words. On November 30, December 2, and December 3, after 2.4 hours of practice with the 100-word paragraph and 10.3 hours practice with changing material, he copied the 100-word paragraph at a rate of 18.1 words per minute with 1⅔ errors per hundred words, and copied the new pages at a rate of 13.9 words per minute with 3.6 errors per hundred words. On January 4, 6 and 7, after 4.7 hours of practice with the 100-word paragraph and 19.6 hours of practice with changing material, he copied the 100-word paragraph at 25 words per minute with 2⅓ errors per hundred words and the new pages at 17.9 words per

Table 1—Original Scores in Learning to Typewrite

	Hill						Rejall					
	Same 100-word paragraph			300-word page of new material			Same 100-word paragraph			300-word page of new material		
Time of practice	Minutes	Seconds	Errors per 100 words	Minutes	Seconds	Errors per 300 words	Minutes	Seconds	Errors per 100 words	Minutes	Seconds	Errors per 300 words
Nov 1	10	00	13	42	00	57						
2	10	00	12	37	00	48	15	53	8	43	50	34
3												
4	9	45	13	30	30	45	10	20	5	36	32	32
5	9	00	2	31	00	43	8	50	9	33	33	33
6	8	30	6	30	30	26	9	4	9	29	24	11
7	7	45	7	27	30	23	7	29	7	25	29	20
8	7	30	4	24	45	30	6	42	5	27	22	27
9	7	5	10	26	00	24	7	8	4	25	40	19
10												
11	6	45	2	24	48	27	8	5	6	29	00	22
12	7	2	3	24	30	23	6	20	9	24	23	34
13	6	43	2	25	45	16	6	25	4	23	28	18
14	6	16	8	25	19	18	5	58	7	23	30	23
15	6	25	2	22	2	17	6	15	3	22	34	28
16	?	?	3	23	23	36	7		8	22	15	26
17												
18	5	46	5	21	6	23	5	23	1	20		19
19	6		4	26	26	21	5	25	8	24	35	26
20	5	25	9	21	51	37	5	10	2	22	45	48
21	5	38	6	22	43	25	4	58	4	22	21	13
22	6		4	20	52	21	4	53	7	21	13	15
23	5	19	9	21	50	11	5	8	8	20	47	18
24												
25	5	23	4	21		10	4	17	2	19	5	14
26	5	35	5	20	14	12	4	38	7	18	40	23
27	5	15	3	17	37	12	4	30	1	19	18	20
28	5	15	1	18	29	16	4	24	6	20	20	18
29	ill						4	32	3	19	8	32
30	5	15	3	20	20	11	4	3	4	17	25	14
Dec 1												
2	6	5	1	22	32	13	4	17	3	18	27	36
3	5	15	1	22	46	8	4	10	4	18	53	18
4	5	40	6	21		16	4	4	8	17	7	17
5	5	55	3	22	20	3	4	30	6	19	23	10
6	5	16	2	21	51	7	4	31	1	17	37	10
7	4	43	0	19	25	9	Out of town					
8												
9	5		2	18	50	4	4	10	7	18	28	11
10	4	30	2	19	40	10	4		11	18	38	25
11	5	51	3	18	39	10	4		3	17	22	20
12	4	39	5	18	9	8	4	15	2	19	20	20
13	4	30	2	19	58	11	3	45	10	16	58	26
14	4	48	6	19		17	3	47	11	18	25	18
15												

TABLE 1—Continued

		Hill						Rejall					
		Same 100-word paragraph			300-word page of new material			Same 100-word paragraph			300-word page of new material		
Time of practice		Minutes	Seconds	Errors per 100 words	Minutes	Seconds	Errors per 300 words	Minutes	Seconds	Errors per 300 words	Minutes	Seconds	Errors per 100 words
Dec	16	4	40	4	16	35	14	3	50	16	18	10	20
	17	4	31	1	18	30	11	Absent					
	18	4	27	7	17	20	15	3	30	7	16	40	21
	19	4	25	3	17	15	8	3	58	2	16	22	13
	20	4	22	1	17	50	4	3	51	1	16	30	5
	21	4	17	2	17	2	12	Absent					
	22												
	23	4	17	2	17	58	12	4	2	8	16	55	21
	24	4	10	2	16	55	8	3	37	10	16	18	22
	25	4	20	3	17	10	9	Absent					
	26	4	17	3	18	48	10	Absent					
	27	4	3	5	17	33	7	Absent					
	28	4	8	2	15	43	11	Absent					
	29												
	30	4	8	2	18		7	Absent					
	31	4		3	16	35	17	Absent					
Jan	1	3	55	1	17	6	8	Absent					
	2	3	57	2	16	32	12	Absent					
	3	4	2	1	16	25	11	Absent					
	4	3	50	3	16	11	10	3	38	9	16	38	33
	5												
	6	3	50	1	17	6	11						
	7	4	18	3	17		7	4		16	17	50	21
	8	3	50	2	16	20	7	3	40	6	17	22	16
	9	4		1	15	27	10	3	20	4	15	2	19
	10	3	40	2	15		19	3	45	4	16	27	6
	11	3	55	4	15	25	9						
	12												
	13	3	55	7	15	10	12	4	4	6	19	17	19
	14	3	35	2	15	20	6	3	43	2	15	20	14
	15	3	33	1	14	45	12	3	16	0	16	36	18
	16	3	23	3	15	12	11	3	52	0	16	44	14
	17	3	32	1	15	15	12	3	50	6	15	38	7
	18	4		1	14	10	5	3	42	2	15	12	15
	19												
	20	3	45	1	14	46	25	3	5	12	14	5	24
	21	3	36	1	14	30	9	3	5	5	15	28	17
	22	3	30	2	15	25	13	3	50	7	16	37	17
	23	3	25	4	14	50	9	3	8	5	15	21	20
	24	3	21	5	14	36	13	3	7	5	15	21	17
	25	3	30	2	15	25	13	3	16	8	15	18	12
	26												
	27	3	30	3	15	50	10	3	25	3	16	28	23
	28	3	34	1	14	16	7	3	22	6	14	56	22
	29	3	33	3	15	8	17	3	13	6	16	3	18

TABLE 1—Continued

		HILL						REJALL					
		Same 100-word paragraph			300-word page of new material			Same 100-word paragraph			300-word page of new material		
Time of practice		Minutes	Seconds	Errors per 100 words	Minutes	Seconds	Errors per 300 words	Minutes	Seconds	Errors per 100 words	Minutes	Seconds	Errors per 300 words
Jan	30	3	30	0	15	18	13	3	8	2	15	25	24
	31	3	34	5	15		16	Absent					
Feb	1	3	24	4	15	38	13	3	5	1	15	20	11
	2												
	3	3	18	4	14	25	13	3	7	6	15	28	11
	4	3	24	5	14		16	2	58	6	14	32	12
	5	3	25	2	13	45	13	3	6	3	14	20	9
	6	3	23	3	13	53	16	3	22	4	14	38	5
	7	3	30	7	13	35	8	3	10	4	13	56	7
	8	3	28	1	13	45	13	3	11	3	14	38	9
	9												
	10	3	26	4	14	45	8	3	25	5	15	20	5
	11	3	17	1	13	32	11	2	50	1	14	9	7
	12	3	17	4	14	12	10	3	10	10	14	22	20
	13	3	16	4	13	8	9	3	9	4	14	13	8
	14	3	21	4	15		7	3	13	3	13	15	9
	15	3	32	3	14	20	10	3	30	4	15	20	3
	16												
	17	3	16	4	13	30	10	3		1	13	52	11
	18	3	6	2	13	20	4	3	10	3	14	9	8
	19	3	5	3	13	55	16	3		4	14	35	9
	20	3	12	8	14	5	12	3	7	1	13	8	12
	21	3	20	2	15		17	3		5	14	15	6
	22	Building locked						3	18	3	13	11	8
	23												
	24	3	10	2	15	35	9	2	55	9	13	31	17
	25	3	13	1	13	55	13	2	54	9	12	34	16
	26	3	10	4	13	40	3	2	48	1	13	48	10
	27	3	8	4	13	55	8	2	43	4	13	13	10
	28	3	10	2	15	5	10	2	48	5	12	5	15
	29	3	11	8	14	30	13	2	48	2	13	8	6
Mar	1												
	2	3	35	7	14	40	9	3		3	12	42	10
	3	2	55	7	13	23	14	2	45	3	12	36	14
	4	3	1	8	13	35	22	2	56	4	13	13	6
	5	3	4	7	13	10	10	3	1	3	13	30	11
	6	3	12	3	13	6	11	2	57	7	13	50	12
	7	3	1	4	12	40	10	2	42	9	11	56	13
	8												
	9	2	48	5	13	10	16	2	35	5	11	49	10
	10	2	49	5	12	50	10	2	31	9	12	15	12
	11	2	48	7	13	40	8	2	33	3	12	30	7
	12	2	48	6	13	18	11	2	30	4	12	18	13
	13	3	6	4	13	10	16	2	29	2	14	28	10
	14	3	2	5	12	28	14	2	39	7	11	36	25

TABLE 1—Continued

	HILL						REJALL					
	Same 100-word paragraph			300-word page of new material			Same 100-word paragraph			300-word page of new material		
Time of practice	Minutes	Seconds	Errors per 100 words	Minutes	Seconds	Errors per 300 words	Minutes	Seconds	Errors per 100 words	Minutes	Seconds	Errors per 300 words
Mar 15												
16	2	49	3	13	5	6	2	37	6	13	25	14
17	3	20	2	12	35	11	2	25	6	11	47	24
18	3	3	3	12	37	12	2	30	10	12	9	12
19	3		5	12	20	13	2	24	7	11	38	12
20	2	50	6	12	50	11	2	23	6	11	55	7
21	3	10	2	12	35	16	2	39	8	11	45	14
22												
23	2	50	5	12	30	9	2	20	6	10	51	14
24	2	48	4	13		15	2	21	13	11	49	4
25	2	55	3	12	30	12	2	18	5	11	40	14
26	2	53	6	12	20	18	2	25	10	10	58	15
27	2	48	9	13	30	9	2	18	11	12	7	5
28	2	59	6	11	45	6	2	28	6	13	22	8
29												
30	2	48	3	12	50	14	2	18	9	11	43	9

minute with 3.1 errors per hundred words. On February 24, 25 and 26, after 7.1 and 29.7 hours of practice of the two kinds, his respective scores were 31.4 words per minute with 2⅓ errors and 20.9 words per minute with 2.8 errors. On March 27, 28 and 30, the last three days of the experiment, after 8.6 hours and 36 hours of practice, his scores were 35.2 words per minute with 6 errors per hundred words, and 23.4 words with 3.2 errors.

The corresponding facts for Rejall are as follows: On the first day, the 100-word paragraph at 6.3 words per minute with 8 errors, the 300-word page at 6.8 words per minute with 11.3 errors per hundred words. On November 30, December 2 and December 3, after practice of 2¾ hours with the same paragraph and 10 hours with changing material, his scores were 23.6 words per minute with 6⅓ errors per hundred and 16.5 words per minute with 7.6 errors per hundred words. On February 1, 3 and 4, after 5.2 hours and 20.9 hours of practice, his scores were 32.6 words per minute with 4⅓ errors per hundred words and 19.9 words per minute with 3.8 errors per hundred words. On March 23, 24 and 25, after 7.2 and 30½ hours of practice respectively, his scores were 42.9 words per minute with 8 errors per hundred words and 25.2 words per minute with 3.6 errors per hundred words. A week's added practice (¼ and 1¼ hours) left these scores unimproved.

The improvement per hour of practice was greater in the case of Hill and Rejall than in the case of the subjects studied by Swift and Schuyler and Book, perhaps because the practice was distributed in much shorter period-lengths, perhaps because of individual differences such as made Rejall improve more rapidly than Hill. Using all these investigations together it appears that forty hours of well-distributed practice will enable an intelligent student to copy on the machine approximately as fast as he can by hand.

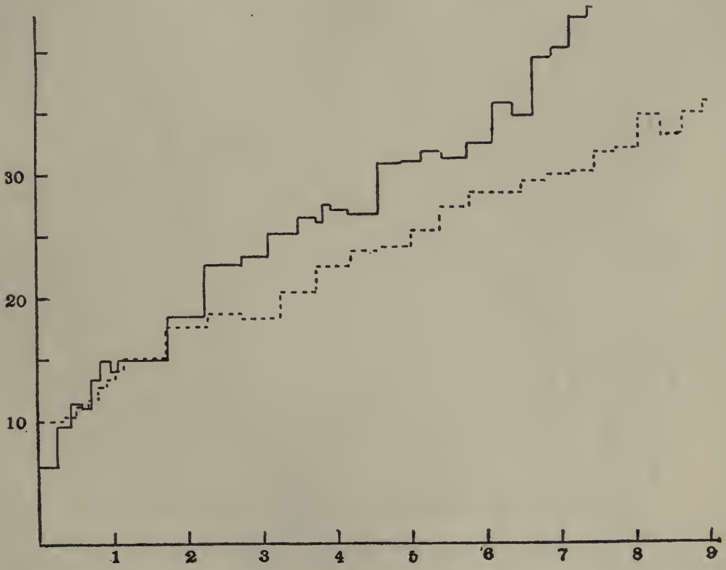


Fig. 1. The Curves of Improvement in Typewriting the Same 100-Word Paragraph. Equal lengths along the base line represent equal amounts of time given to practice. Equal heights above the base line represent equal numbers of words written per unit of time. The continuous line is for Rejall; the dash line is for Hill. The figures below the base line stand for hours of practice with the 100-word paragraph alone (i. e., exclusive of the practice with changing material).

The Limit of Improvement

In the case of copying changing material there is, of course, no question of approach to a limit to improvement. It is also the case that the limit was not reached by either Hill or Rejall in copying the same paragraph, their rates for the last eight weeks of practice being, in order, as follows (in words per minute):

Hill	Rejall
26.2	31.7
29.8	31.1
31.3	32.3
31.5	35.5
31.9	34.5
34.5	39.2
33.0	40.0
34.8	42.2

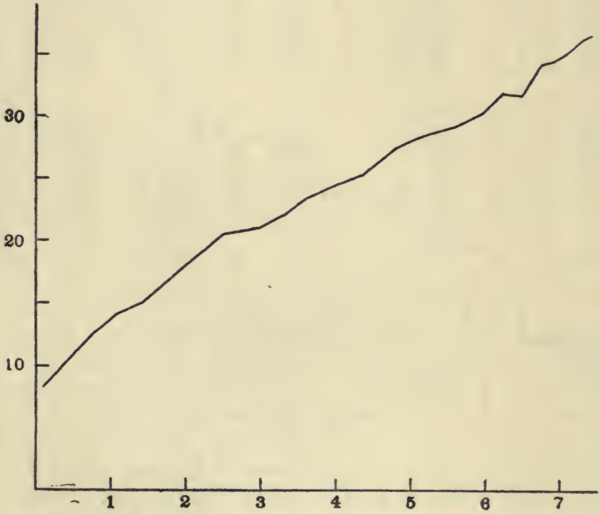


FIG. 2. The Average of the Two Curves of Fig. 1.

CHANGES IN THE RATE OF IMPROVEMENT

The practice curves for the speed of writing the same 100-word paragraph are shown in Fig. 1. The average curve is shown in Fig. 2. After the first few days these curves are plotted from weekly averages. The effect of any justifiable scheme of penalizing for errors upon the curves would be slight. Hill's curve shows no considerable fluctuations save the initial rapid rise, the failure to improve in Day 2 over the record of Day 1, and the drop during a week that included four days of illness. Rejall's curve shows a more pronounced initial rapid rise and also the appearance of a positive accelera-

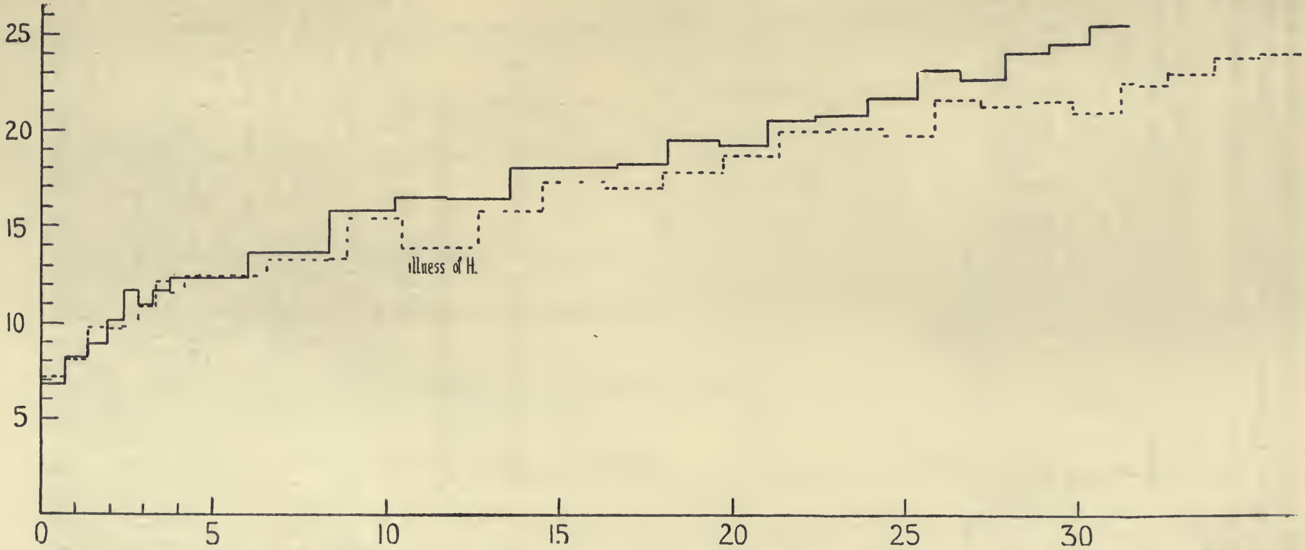


FIG. 3. The Curves of Improvement in Typewriting with Changing Material. Arrangement as in Fig. 1, save that the figures below the base-line stand for hours of practice with new pages alone, (i. e., exclusive of the practice with the 100-word paragraph).

tion in the last 100 minutes of practice. The absence of general negative acceleration—that is, of a parabolic form for the curve as a whole, and of any clear 'plateaus' or 'resting stages' is noteworthy.

The practice curves for the speed of copying new material are shown separately in Fig. 3; the average of the two is shown in Fig. 4. After the first few days the curves are plotted from weekly averages. These curves would be only slightly altered by any rational penalizing for errors. Except for the rapid initial rise and the drop in the case of Hill during a week that included four days of illness, there are no notable departures from a straight slope, respresenting uniform increments in speed per hour of practice.

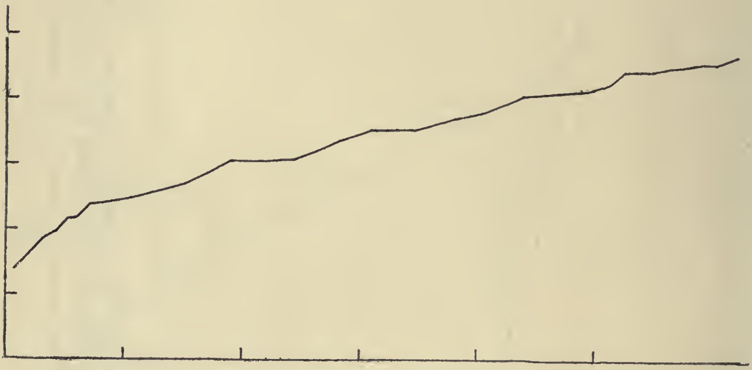


FIG. 4. The Average of the Two Curves of Fig. 3.

THE PERMANENCE OF IMPROVEMENT

The records in the case of Rejall for the first day of the 114 in '07-'08, for the last ten days of the 114, and for the memory test four years and a half later, are shown in Table 2.

There was evidently a very great permanence of the old learning. After writing the paragraph fifteen times and writing fifteen of the 300-word pages, the efficiency with the single paragraph was as high as had been attained by a hundred and fourteen such exercises four and a half years before. Five hours of practice with changing material (plus about an hour on the same paragraph) brought Rejall to very nearly the same ability with changing material that thirty hours had been required to attain originally. His average score in the six days after five hours of relearning was 26 words per minute, with 5½ errors per hundred words.

TABLE 2—THE PERMANENCE OF IMPROVEMENT IN TYPEWRITING

	ORIGINAL PRACTICE							RELEARNING AFTER 4½ YEARS					
	Same 100-word paragraph			300-word page of new material				Same 100-word paragraph			300-word page of new material		
	Minutes	Seconds	Errors per 100 words	Minutes	Seconds	Errors per 300 words		Minutes	Seconds	Errors per 100 words	Minutes	Seconds	Errors per 300 words
1907-8							1912						
Nov. 1	15	53	8	43	50	34	Oct. 1	4	52	3	18	50	19
							2	3	55	3	16	....	24
Mar. 19	2	24	7	11	38	12	3	3	30	7	15	55	22
20	2	23	6	11	55	7	4	5	30	4	14	15	19
21	2	39	8	11	45	14	5	......		....	....		....
22	......		....	....		....	6	......		....	....		....
23	2	20	6	10	51	14	7	3	20	8	13	35	15
24	2	21	13	11	49	4	8	3	5	4	13	20	26
25	2	18	5	11	40	14	9	3	...	4	14	50	13
26	2	25	10	10	58	15	10	2	50	11	14	25	13
27	2	18	11	12	7	5	11	3	...	6	13	25	17
28	2	28	6	13	22	8	12	......		....	....		....
29	......		....	....		....	13	......		....	....		....
30	2	18	9	11	43	9	14	2	48	6	13	....	20
							15	2	40	7	12	45	17
							16	2	40	7	13	55	21
							17	2	40	7	13	40	18
							18	2	20	3	13	15	12
							19	......		....	....		....
							20	......		....	....		....
							21	2	30	7	14	5	22
							22	2	15	5	13	....	22
							23	2	15	7	12	....	10
							24	2	25	8	12	15	20
							25	2	30	10	12	20	10
							26	......		....	....		....
							27	......		....	....		....
							28	2	30	7	12	....	18
							29	2	30	9	11	50	27
							30	2	30	8	12	....	16
							31	2	30	7	11	40	31
							Nov. 1	2	20	9	11	20	21
							2	......		....	....		....
							3	......		....	....		....
							4	2	15	11	11	30	15
							5		Illness		....		....
							6	2	30	8	12	40	16
							7	2	18	6	12	35	24
							8	2	14	7	10	46	17
							9	......		....	....		....
							10	......		....	....		....
							11	2	12	9	10	54	16
							12	2	13	5	10	59	10

TABLE 3—AVERAGE DAILY CHANGES IN THE TIME REQUIRED TO TYPEWRITE X WORDS, DUE TO PRACTICE FROM MONDAY TO SATURDAY, AND CHANGES FROM SATURDAY TO MONDAY. MINUS SIGNS EQUAL GAINS

	INDIVIDUAL A. E. R.				INDIVIDUAL L. B. H.			
	New Material: 300-word page		Same Paragraph: 100 words		New Material: 300-word page		Same Paragraph: 100 words	
Nov 4– 9	—130		—38		—54		—32	
Nov 9–11		+200		+57		—72		—20
Nov 11–16	—81		—13		—17		—4	
Nov 16–18		—135		—97		—137		—39
Nov 18–23	+9		—3		—9		—5	
etc.		—102		—51		—50		+4
	—20		—3		—10		—2	
		+62		+14		+132		+50
	—13		+4		—37		—16	
		+51		—21		—35		+17
	—1		—5		+2		—2	
		—15		+3		—145		—8
	—33		0		+5		—5	
		+25		+11		+56		0
	....		....		—27		—2	
		....		....		+137		0
	....		....		—22		—4	
		....		....		+55		0
	—28		—5		—20		+1	
		+170		+19		—15		0
	—49		—4		—12		+1	
		—67		—37		+36		—15
	+15		+2		+8		—3	
		+70		+9		+25		0
	—17		—5		—2		—1	
		+8		+2		—73		—6
	—10		+1		—8		+2	
		+42		+14		+60		—2
	0		+1		—5		+1	
		—88		—30		—50		—16
	—8		+4		+23		+1	
		+20		—23		+35		—10
	—5		—1		—13		0	
		—16		+12		+10		+24
	—9		—4		—24		—7	
		—7		—7		+30		—13
	—3		+1		—8		+3	
		+49		—2		+37		—13
	—20		0		—6		+4	
		—54		—19		—5		—20
	+30		+2		—9		+2	
		—89		—10		+65		—13

THE CONDITIONS OF IMPROVEMENT

The conditions of improvement in typewriting were not especially studied by Rejall and Hill, but their data permit us to study one sample question,—namely, that of the influence of the Sunday rest,—and to note the apparent effect of practice during an illness.

Comparing the gains from Saturday to Monday with the average gain from any one day to another from Monday to Saturday, we find the facts of Table 3.

Table 3 does not tell a very clear story, for the Sunday effect is not alike for the two sorts of work, and is not closely the same for the two individuals. In general it seems favorable for improvement in writing the same short paragraph, and unfavorable in the case of the changing material. There are also complications due to a difference, if the figures are taken at their face value, between the early and the late months of practice. The main facts appear more clearly if we combine each three successive week-records of Table 3, and replace the measure of gain by measures of the *superiority* of the Sat.-Mon. gain to the average gain from day to day between Monday and Saturday. A minus sign will equal *inferiority*. We then have Table 4.

TABLE 4—SUPERIORITY OR INFERIORITY OF THE SATURDAY-MONDAY GAINS

	A. E. R.		L. H. B.	
	300-word page	100-word paragraph	300-word page	100-word paragraph
First 3 weeks........	—55	+12	+59	+4
Second 3 weeks*....	—48	—3	—1	—27
Third 3 weeks.......			—98	—4
Fourth 3 weeks......	—79	+1	—24	+5
Fifth 3 weeks........	+4	+4	+16	+9
Sixth 3 weeks.......	—6	+6	—30	—2
Seventh 3 weeks.....	+33	+11	—40	+18
Average..........	—25	+5	—17	0

*4 in the case of A. E. R.

The change from early to late months appears most clearly if Table 3 is condensed into three divisions for the first nine, the next six, and the last six, and if the two individuals' records are averaged. We then have Table 5.

It appears that in writing the 100-word paragraph during the last twelve weeks practically no improvement was made from Monday to Saturday.

TABLE 5—AVERAGE DAILY CHANGES IN THE TIME REQUIRED TO TYPEWRITE X WORDS, DUE TO PRACTICE FROM MONDAY TO SATURDAY AND THE CHANGES FROM SATURDAY TO MONDAY

Average change from one practice-day to the next. Minus signs equal gains.

	MONDAY TO TUESDAY, ETC		SATURDAY TO MONDAY	
	300-word page	100-word paragraph	300-word page	100-word paragraph
In the first 9 weeks......	—26	—9	+2	—7
In the next 6 weeks......	—11	—1	+10	—6
In the last 6 weeks.......	—5	0	+7	—8

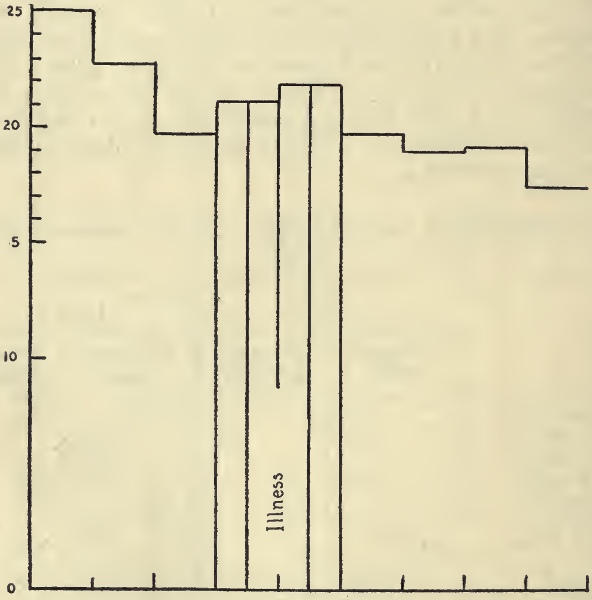


FIG. 5. Efficiency in Typewriting the Same Paragraph of 100 Words, before, during, and after illness. Subject, Hill. (Each unit along the abscissa equals three days; the two three-day periods of the illness are so marked; the height of the curve equals the time required to copy the paragraph.)

The only notable differences in physical condition reported were an illness of several days (Dec. 2, 3, 4 and 5) and a bad cold on one day (Jan. 4), both in the case of Hill. The latter seemed to slacken improvement somewhat; the former was almost surely associated with such slackening. The ordinary ups and downs from day to day were so great that the trend of the curve over a fairly long interval has to be examined for evidence. Figs. 5 and 6 show the facts in the case of the longer illness. There can be little doubt of the harmful temporary effect of the illness on efficiency, and it seems to have reduced improvement in the case of typewriting new material. That the practice during the illness was any less beneficial than ordinary practice to the function of copying the same paragraph, seems dubious.

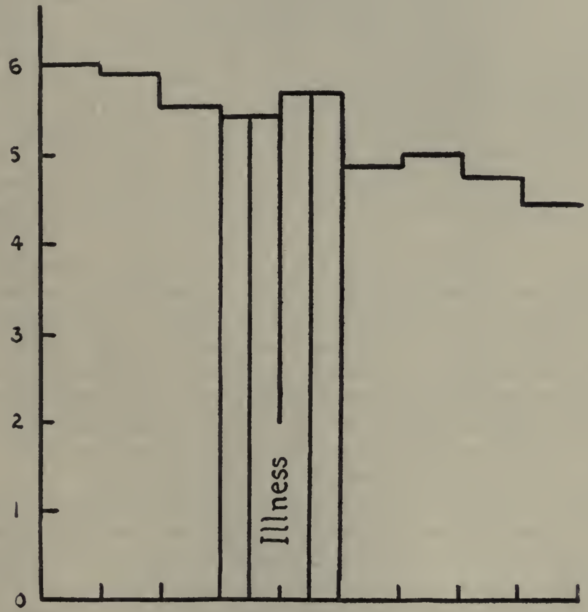


FIG. 6. Efficiency in Typewriting New Material, 300 Words Daily, before, during, and after illness. Subject, Hill. (Each unit along the abscissa equals three days; the two three-day periods of the illnes are so marked; the height of the curve equals the time required to copy 300 words.)

EDUCATION AND SOCIAL CONDITIONS

By Jonathan F. Scott, Ann Arbor, Michigan

One of the most striking phenomena of modern times is the extraordinary confidence in the efficacy of education as a progressive force. Ardent admirers of its powers hold that education is destined to become the great factor in human evolution, the chief means by which a higher and better society is to be produced. Some believe that it can be substituted for religion as the basis of ethics. Ross says, in this connection, "The ebb of religion is only half a fact. The other half is the high tide of education. . . . As the state shakes itself loose from the church, it reaches out for the school. Step by step with the disestablishment of religion proceeds the establishment of education."[1] In view of this attitude it is worth while to show how education has been limited in the past, and is likely to be limited in the future, as a force in human progress.

In the first place, history shows that types of education are the outcome of social and economic conditions rather than original influences shaping these conditions. An educational system intensifies the dominant conceptions and ideals of a civilization and helps to perpetuate them. It is therefore more useful for carrying out existing ideals than for creating new ones; it is narrow, too, in so far as the social conditions from which it is derived are narrow. In a word, its limitations are those of the civilization out of which it grows.

Second, history shows that a type of education once created tends to persist after the forces that gave it birth have passed away. It may even be transplanted to an entirely different civilization. Periodical adjustments are therefore necessary to bring education into harmony with living social forces.

The problem of establishing the best type of instruction does not end here, however, for the forces to which the educational system adjusts itself—though these are the dominant forces of the existing civilization—are not necessarily those which will ultimately make for the highest progress of society. In fact, it is quite possible that these forces have already been overemphasized and that what is necessary is not a further emphasis of them but a reaction against or a new evaluation of them. In other words, if education merely strengthens the bias of a civilization it is distinctly limited as an instrument for the service of humanity.

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[1] Social Control, p. 175.

A survey of various types of education in the past will bring out more clearly these limitations, and will indicate the danger to society of attempting to substitute education for religion.

Sparta furnishes a conspicuous example of a narrow educational system growing out of the conditions of the time. Sparta's great problem was a military one. Only through eternal vigilance could she maintain her haughty oligarchical control over Perioeci and Helots, while her ambitious dreams of conquest accentuated the demand for a rigorous training of her citizens. This training she could afford to give, partly because the labor of Helots relieved Spartan citizens from the necessity of supporting themselves. The children were educated by the state and were subjected to the severest discipline. Education was almost entirely physical. Courage and endurance were fostered, but at the expense of the gentler virtues. Loyalty to the state was strengthened, family life weakened. Their system of education was narrow and brutal, though it carried out Spartan ideals and thus helped to make of the little Lacedaemonian community a great state.

Education at Athens was no less the outcome of social and economic conditions than at Sparta, but Athenian civilization was broader and her education therefore more diversified than that of her rival in the Peloponnesus. Athens did, indeed, find it necessary to be well prepared for war and revolt, and therefore developed an efficient system of physical and military training. But danger from external and internal enemies was not as great at Athens as at Sparta, and the Athenian youth had opportunity to turn to other forms of instruction. This education, other than physical and military, was made possible, however, by "the existence of a large class of slaves to do all the drudgery of life, and to leave the dominant class free for higher pursuits and amusements."[2] It was an education not of the whole Athenian people, but of a small upper class,[3] and it was intended to prepare for "the rational enjoyment of leisure hours." Up to the age of Pericles this kind of education consisted almost entirely of music and letters.

As individualism developed in Athens and loyalty to the state began to give way before "eudaemonism" (the search for personal happiness) the range of instruction increased. Towards the end of the fifth century a diversified system of what may be called secondary education began to appear. Philosophy, mathematics, drawing, painting, and above all rhetoric, were among the subjects taught. It was not eudaemonism alone that underlay the study of rhetoric, for with the growth of democracy a young man might hope, with a knowledge of this subject, to carve out for himself a career in the law-courts or in politics.

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[2] Mahaffy, Social Life in Greece, p. 259.
[3] Freeman, Schools of Hellas, p. 289.

With all this intellectual brilliancy, however, Greek civilization was decaying. The old religion gave way before the advances of skepticism. The ravages of war and the declining birth-rate caused depopulation. Expenditures increased and revenues shrank, patriotism lost its lustre and other virtues weakened. It was then that philosophers formulated elaborate schemes of education for the rehabitation of Greek life, but education showed itself utterly unable to meet the situation. The increasing effeminancy of the Greeks was reflected, as was seen even as early as Aristophanes' time, in the effeminacy of education.[4] The schools of the philosophers served to increase eudaemonism and to incline youth to a life of contemplation and intellectual speculation, at a time when the active virtues were most needed. Greek civilization perished in a blaze of intellectual and artistic glory, and the great social problems remained unsolved until the advent of Christianity.

Little need be said here of Roman education, for after Rome had passed from barbarism her learning was chiefly taken from Greece. On taking over this education, however, Rome emphasized those subjects best suited to her conditions, and in particular laid stress on rhetoric and oratory, which in the days of the republic were of great practical importance. "It must be recalled," says Monroe, "that public oratory then performed the function that is now divided between the press, the pulpit, the bar, and the university."[5]

Western Europe having fallen into a condition of semi-barbarism with the decay of the Roman Empire, it became the duty of the Middle Ages to fuse what it could of the old Roman civilization with the new barbarian elements. Christianity appeared, with ideals destined to dominate humanity and to influence civilization for centuries. Christianity, institutionalized through the Catholic Church, took upon itself the task of educating the barbarian, using for this purpose not merely the Bible and other religious writings, but also something of the material provided by Greece and Rome.

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[4] Davidson, Education of the Greek People, pp. 92 ff.

[5] Monroe, Text-book in the History of Education, p. 163.

The existing Graeco-Roman curriculum was reshaped somewhat to meet the new social conditions. The seven liberal arts taught in the Roman schools of the later Empire[6] became the basis of medieval school-study. But grammar must point morals and yield itself to mystical interpretations; arithmetic and astronomy must find a large part of their value in calculating the date of Easter. Dialectic must aid in the refutation of heretics, its aptness for this service leading churchmen to value it highly. In general, the cloak of religion was thrown over the old pagan curriculum, and on its head was placed the crown study—theology. Education became a discipline, a means to prepare the soul for the future life. Thus the Middle Ages crystallized its ideals and aspirations in its educational system; and the narrowness of the civilization was mirrored in the narrowness of the instruction.

At the close of the Middle Ages social conditions brought to the classical literatures a new importance in education. Renaissance and Reformation united to do them homage.

It has been said that the task of the Middle Ages was to educate the barbarian up to a point where he could carry on the civilization of the world. The Middle Ages could not take up the work of civilizing Europe at the point where Rome stopped, for the medieval man was incapable of comprehending Roman civilization and was more or less antagonistic to it. Much of the literature of antiquity was lost or buried in monasteries. Gradually, however, the religious opposition to antiquity decreased in effectiveness, the things of this world exercised a stronger appeal, the writings of the Greeks and Romans became accessible in larger numbers to Western Europeans, and were better comprehended than in earlier days. In a word the spirit of the Renaissance developed.[7]

When this power of understanding the ancient world had been achieved, what could be more natural than for the European to turn back with enthusiasm to the literatures of Greece and Rome, beside which most of the writings of the Middle Ages were as the compositions of children? Europe came to look upon the classics as the only true sources of culture; it turned to them also as the great reservoirs of practical information. "It should be remembered," says Woodward, "that one obvious motive to the reading of classical, and particularly of Greek authors lay in the fact that every student of antiquity, and of the ethical and scientific lore enshrined in ancient literature, was compelled to have recourse to original sources. . . . . To read Roman history involved of necessity a first-hand study of Livy. Greek history was only to be had from Thucydides, Zenophon, or Plutarch. Geography must be learnt from Strabo or Ptolemy, Mela or Dionysius. Aristotle, Theophrastus and Pliny were the indispensable manuals of science.”[8] Thus antiquity profoundly modified European civilization; and the schools, responding to this change, gradually gave to the classical writings a leading place in the curriculum.

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[6] Abelson, The Seven Liberal Arts, p. 6.

[7] The question of the time at which the classical Renaissance began need not concern us here. There was an important humanistic movement in the eleventh and twelfth centuries. But the roots of the Renaissance extended back even farther into the Middle Ages.

The great revolt against the Catholic Church had its share, too, in altering the studies of the schools. In the hands of the clergy lay the responsibility for the interpretation of the Bible, for the exposition of correct theology. In the theological warfare between Protestants and Catholics, in the combats among the various Protestant sects, matters of doctrine became all-important; and the Scriptures had to be studied in the original tongues, Greek and Hebrew, in order to avoid incorrect interpretation as far as possible. Nor could any theologian afford to neglect Latin, the language of the bulk of ecclesiastical writings.[9]

It is thus easy to see why Latin and Greek became the staples of study in the schools. Western Europe, its preliminary education completed, must build upon antiquity in order to carry on the civilization of the world.

Religion, also, saw in the classical languages and in Hebrew the keys for unlocking the Scriptures, the weapons of theological warfare. Thus a dominantly classical education met the social demands of the time.

It has already been pointed out that education does not always respond readily to the demands of new social forces. So strong are the influences of tradition, inertia and conservatism over systems of education that these are not easily reconstructed, no matter how pressing the demands from the outer world. The studies of rhetoric and oratory, of so great practical value in the free days of the Roman Republic, retained their place in the schools under the imperial hierarchy, serving chiefly to set the sign of culture on a decadent aristocracy. The curriculum of the Roman schools in the last centuries of the empire was taken over by the Middle Ages and, somewhat modified, held its own in church schools for centuries in spite of the antagonism of medieval ideals to those of Rome.

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[8] Education during the Renaissance, p. 19; other examples of the practical value of the classic writers might be cited:—Cicero and Quintilian for oratory, Vergil for agriculture, Galen and Hippocrates for medicine, Euclid for geometry, etc.

[9] In the oft-quoted preamble of the Massachusetts school act of 1647 lies a good illustration of the emphasis laid by Protestants on the teaching of languages, with the reasons therefor: “It being one chiefe piect of y^{t} ould deluder, Satan, to keepe men from the knowledge of ye Scriptures, as in form^{r} times by keeping y^{m} in an unknowne tongue, so in these latt^{r} times by pswading from ye use of tongues, y^{t} so at least ye true sence & meaning of ye originall might be clouded by false glosses of saint seeming deceivers, y^{t} learning may not be buried in ye grave of o^{r} fath^{rs} in ye church & commonwealth, the Lord assisting o^{r} endeavo^{rs},”—etc.

In the same way the classics long held their prominent position in education, in spite of the fact that their value to society was inevitably decreased as civilization changed and advanced.

The very fact of its absorption by the modern world lessened the value of antiquity in European education. This process of absorption went on gradually. The classic writings which had opened up a new world to the European of the Renaissance were translated into the vernacular languages and thereby the need of turning to the ancient tongues was diminished. Furthermore, vernacular literatures, French, English and Italian, arose to rival in beauty and grace the writings of Greece and Rome. Homer, once the incomparable, yielded to the supreme genius of Shakespeare. Out of the spirit of the Renaissance, fed by the writings of Aristotle, Galen, Eratosthenes and others of the ancient writers, rose the current of modern science, deflected somewhat from its course by the theological strife of the sixteenth and seventeenth centuries, returning to its channel and growing to a mighty stream in the eighteenth and nineteenth. Through experimentation, investigation and research a vast body of knowledge unknown to the ancients, but affecting life on every side, was given to the modern world. This new knowledge, as well as the new literature, had ultimately to find its place in the schools.

The reasons offered by religion for the study of the classics lost weight, too, as civilization altered. Religious zeal waned, especially after the Thirty Years War, and the careful interpretation of the Bible became of less and less importance; men were turning to other interests. With the growth of science and the parallel development of philosophy, the world became more skeptical; men questioned even the fundamentals of Christianity. The questions of these skeptics could not be settled by proof from the Bible, for the truth of the Scriptures themselves was doubted. The old weapons furnished by the study and interpretation of the holy writings were too dull for the battle with the new knowledge.[10]

Two other influences which have worked powerfully to shape our modern civilization have injured the power of the old classical education. Democracy has given the common man an amount of power that would astonish his predecessor of a few centuries ago. Through the extension of the suffrage he has come to share in governmental activities and is constantly forcing some new recognition of his strength. The ultimate effects of the spirit of democracy on education no one can yet foresee, but they certainly do not tend toward a dominantly classical curriculum.

The other important influence is that of commercial and industrial advance. With the opening of the modern era, began a commercial development which in the seventeenth, eighteenth and nineteenth centuries grew to enormous proportions. In the eighteenth century the invention of labor-saving machinery initiated the Industrial Revolution. Science was harnessed to the chariot of industrialism, and made to draw it along the road of material progress. Great smoky cities sprang up, holding out grimy beckoning hands to the workers on the farms. The middle class—manufacturers and tradesmen—gained enormously in power and importance, and their ideas and modes of living have profoundly affected modern civilization.

With the changed social conditions resulting from these influences the old classico-religious education, growing out of Reformation and Renaissance, bore no very close relation. But so deeply was it rooted in the school systems of Europe and America that it persisted long after the forces that gave it birth had lost their vital power.

Gradually, however, modern civilization has been forcing an adjustment of education to its real or supposed needs; we are in the midst of this adjustment to-day. During the past century the ideal of democracy, working with other influences, especially the economic, has brought about the general establishment of free public schools in the United States. But there is a wide-spread feeling that the school has not responded sufficiently to the economic demands of the age. Commercialism and industrialism have become factors so powerful in civilization that the school cannot afford to ignore them; the practical, utilitarian character of our modern world demands their recognition.

Hence the emphasis on industrial and vocational education.

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[10] It is interesting to note, however, that these weapons are still used by some clergymen who seem to think them sufficient to conquer the enemies of religion.

The economic pressure on the American school is particularly strong at the present moment. With the passing of frontier conditions in our country, competition is increasing among workers and there is less and less room for the untrained mechanic. The old apprentice system has virtually passed away, and no adequate scheme of instruction has yet been established to take its place; manufacturers complain of the dearth of skilled workmen. American manufacturers are invading foreign markets and attempting to compete on equal terms with the manufactures of countries that have definitely adopted systems of industrial and technical education. The economic success of Germany is attributed largely to her adoption of this sort of education, and American national ambition demands the use of the same means. In general it may be said that as success in the economic struggle seems to our age all-important, the future is likely to see the adoption of a type of education far more practical than that of to-day.[11]

In this success lies the possibility of danger. As in the past education has been too military, too unmoral or too religious, so in the future it may become too utilitarian, thus intensifying the practicality of a civilization already over-materialistic. No doubt more practical instruction of the kind now coming to the front is truly needed for the solution of present problems, but if it dominates the school, society will ultimately suffer.[12]

There are, indeed, possibilities of a broader education in the future than the past has yet known. The tendency is stronger to-day than ever before to psychologize education, to adjust it to the needs, interests and capacities of the child; and as the nature of the child is many-sided, so we may perhaps have an approach toward a many-sided education. The school may thus lay a necessary emphasis on certain factors which the existing civilization minimizes. But even so, studies which are not in harmony with the prejudices of society at any given period will find it hard to secure a place of importance in the curriculum.

The limitations from which education has suffered in the past show, then, the danger of attempting to substitute it for religion. The great strength of religion lies in the fact that it can furnish high ideals and supply the motive power for carrying them out. Thus it can be and has been a great force in human progress. " In the world's history," says an eminent scholar, " no culture, no education, no political training, has been able to rival the mature and ultimate effects of Christianity in humanising society."[13]

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[11] Scott, J. F., Economic Reasons for Vocational Education, Pedagogical Seminary, June, 1913.

[12] At the present time the attempt is being made to retain the old instruction while introducing the new. The result is that the curriculum is frequently loaded down with a great variety of subjects. Will the school be able to carry this burden? Will not many of the older studies either disappear or occupy a much smaller place in the school programme?

Education is an instrument rather than a creative force. Its history shows it to have been the outcome of social and economic conditions. It has been useful in intensifying these conditions, in carrying out existing ideals. But it is doubtful whether it can, of itself, create the influences by which humanity is to be uplifted; for these we must look elsewhere.

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[13] Mahaffy, Social Life in Greece, p. 237.

THE TEACHER'S NEED OF A COMMUNITY LIFE

By Martha MacLear

The teaching profession is one of the most taxing as well as one of the most engrossing of all the professions. It may be compared with the ministry in that it seeks to develop character; with medicine, in that it aims to preserve and restore health; with law, in that it acts as mediator between the public and the schools; with social work, in that it feels the necessity of knowing the home environment of the pupils and social conditions of the city. If this were not enough, the members of this profession are required to rival the business world in the keeping of records, accounts and statistics; the tact of a diplomat; the stern discipline of a policeman; and the reassuring gentleness of a mother. All of this is aside from any teaching per se which may be required or any amount of scholarship that may be needed to make the work effective. In the light of these facts, the wonder is not that so few men go into teaching but that any go; not that there are so few first-class teachers but that there are any; not so wonderful that the profession needs holidays and that so many lose their health but that any survive.

We hear a great deal about untrained teachers and no one can deny that the accusation holds good. But one might well pause and ask in what way they need more training. Is more book knowledge needed? undoubtedly yes. Is more training in method needed? assuredly so. But will these meet the requirements of such a taxing profession? Can mere book knowledge or facility in method make one capable of assuming all the offices of a lawyer, a minister, a doctor, a diplomat, a mother, a policeman or a business man? Book learning and method will help in the simple art of teaching, but nothing can avail for success in the difficult art of education but a wide acquaintance with life itself.

The stricture has been made that a teacher goes out of one door of the college or normal school and straightway into the door of the school. Enclosed always between four walls, little or no acquaintance with life is had. In addition he is so shut in by the walls of class that he is afraid to move in any human direction for fear of losing caste. Temperamentally the profession inclines to bookishness and intellectual snobbery. These conditions the colleges and normal schools can help only indirectly. Especially are the normal schools, which draw their clientele from a small locality, powerless to meet such a need. A large university offers better opportunity, but at best can offer only the suggestion that such a need exists and point the way to the remedy.

What road shall the teacher pursue to fit himself to meet all the requirements that will be made of him? What can he do to make himself fit to be a leader in the community, for a teacher must be a leader or he is recreant to his trust. There is one way and only one way to even approximate such an all-round development and that is by becoming an integral part of the community life.

Teachers live too much to themselves. They form too much a class apart. They are so prone to become over much engrossed in the small details of their profession (this, of course, is especially true of women), that they forget the larger outlook. All teachers can talk about their grade or school; few teachers can talk about education in a large way. A year or so ago I had a striking example of this limitation. I tried to form an educational club of teachers, but failed. The reason given by all was that they were too busy and that, as we were not teaching the same subjects, there could be no points of common interest. In other words, they were so engrossed with the details of their own small sphere that they had no time to give to a larger vision.

What does it mean to become part of the community life? It means to be recognized as a vital member of the community, as a personality, not as a teacher. It means to be able to feel the throb of the community life, to be alive at all points to what is going on; to be able to talk, without dogmatism, to any one, from the learned scholar to the frivolous society girl, from the club woman to the tired mother. In short, it means to be alive with human sympathy and interest for all phases of life and for all conditions of men.

But how may this be accomplished? First by keeping oneself in good physical condition, for the world always looks askew to a sickly person. With good health as an asset, it will be easy to make friends with all kinds of people. At the risk of being accused of lack of esprit de corps, I would say that it is best for a teacher to have the most of his friends outside of the profession. Three or four teachers at most might be the quota. The rest of his friends might well be lawyers, doctors or business men, especially some social workers. An actor or musician, a soldier or an artist would be valuable additions to his circle.

One can readily see that such a circle of friends would call for the development of various sides of a man's nature. It would necessarily broaden his interests and lead him into paths far afield. But he would return to his work with mind refreshed and hope renewed.

But there are other friends, besides living ones, who cannot be neglected. There are books, the guide and comforter of many hours, which one cannot afford to overlook. Not only are the classics waiting to give us inspiration but there are a host of contemporary writers for whom it is worth while giving up a bit of gossip or a moving picture show. Galsworthy, Chesterton, Bernard Shaw, Synge, Yeats, Masefield, Noyes, and a host of others are doing work that should receive our consideration.

Then there are concerts and plays, lectures and political meetings, the daily press and one good club at least. All of which are as necessary to the well-being of a teacher as the food he eats.

Quite as essential to the welfare of the profession is a hobby. Educationally it is called an avocation—some commanding interest outside of one's specialty. It may be art, it may be music, it may be walking or birds or flowers, it may be equal suffrage or reform. Any live issue will be of inestimable value in keeping the teacher young and alert. And such an extra-curriculum activity will be like a live wire in making connections with the life of the community.

The question may well be asked, where is one to find time for all of these activities? By first going to his task well prepared in his profession; by making haste slowly until he has found himself, for all good things are worth waiting for.

Among the many things extraneous to the curriculum that we learned at college was this—Never attend a faculty meeting unless due notice of a week's time has been given. For it is impossible for a superintendent or principal to buy a teacher body and soul. The time outside of school hours belongs to the teacher and cannot be taken by the principal unless due notice is given. This is to look at the school from the teacher's viewpoint but such a view must be taken if teachers are to grow.

It is unwise to spend much time on details; better slight the non-essentials. It is never wise to be a slave to correcting papers, especially English papers. If the school will not provide a reader of compositions, the teacher might correct only three out of five. No school has a right to stunt a teacher's growth. One great leakage is the time spent gossiping about the other teachers or the pupils or criticizing the principal or supervisor. Work easily done, without worry, is among the first essentials to the gaining of leisure. If the teacher is to be to the school all that he should be then he must be a vital, well-rounded personality. And he can be this only through having a certain amount of leisure to mingle in the community life. It is absolutely necessary that he have some life outside the school. It is a vivid realization of what life is and what life means that make for a vital individuality, the only kind of individuality that counts in unconscious tuition, which, after all, is the largest part of any work in the school. It is by the power of suggestion that we accomplish the most for our students. At best we can give them only a modicum of knowledge. But we can inspire them to live, if we ourselves are vividly alive.

CONTRIBUTIONS OF THE DANISH ANTHROPOLOGICAL SURVEY TO CHILD-STUDY

By A. N. Gilbertson

In 1904 was appointed, under the auspices of the Danish government, an Anthropological Committee, for the purpose of conducting an anthropological survey of Denmark. The Committee has published a partial report of its researches, which are still being continued. The report, entitled "Meddelelser om Danmarks Antropologi" (Communications on the Anthropology of Denmark), consists of studies on the physical characteristics of the Danish population, including the height and weight of the body, the form and size of the head, the correlation between the height of the body and the dimensions of the head, the color of hair and eyes, etc.

Several of the studies are of special interest from the standpoint of child-study. Two of these, by Povl Heiberg and H. J. Hansen, are on the weight of new-born children; one, by Poul Hertz, is on the growth of children during school years, and two, by Sören Hansen and Harald Westergaard, deal with the question of the alleged inferiority of first-born children.

The Weight of New-born Children

Heiberg makes a searching examination of the data on the subject already found in the literature. He finds that most earlier writers were too content with loose statements and further that they laid too much stress on extremes. Thus he, criticizes Vierordt, in the much-used "Daten und Tabellen" (1906) for bringing together data given by some thirty writers, without any critical analysis of the relative value of the data. For instance, Vierordt gives 252 observations of one investigator the same weight as over 3,000 of another.

The author emphasizes, and illustrates from earlier studies, the necessity of extreme care in securing and analysing data. "General averages are worthless, unless the components and their relative values are known," for instance, the sex of the children, the proportion of first-born, accuracy of the weighing, etc. The difference between the weights of boys and girls is so great, that fairly small changes in the relative numbers of the two sexes will affect the average. Further, it has earlier been shown that the weight of the first-born is less than that of the later children. The changes this difference may make in the general average can be understood from the fact that the average weight rises by no less than 75 gm. in each successive birth.

As an example of the importance of exactness in weighing the child the author gives the following: "In the case of 3,000 children the average weight measured to 50 gm. was 3,378.0 gm., but if the weight is taken no nearer than 150 gm. this average weight would be 3,376.5 gm. and with an exactness of only 250 gm. (about half a pound) on each weighing, the average would be only 3367.7 gm." He points out that "the tendency of observers to discard the lowest values and to prefer even numbers must also be taken into account."

Since the difference in the average weight of new-born children in two groups is necessarily of small dimensions, the material must be collected under very strict conditions. These conditions the author summarizes as follows: "In each of the two groups the number of records must be at 2-3000 (the average error would then be about 9 gm.). The sex of the children, also whether first-born, second-born, etc., must be known. Further, the exactness of the weighing should be stated, as also where and how the lower limit is determined. Other details should also be considered (*e.g.* the exact time when the weight has been taken in relation to birth and so on.)"

The data analysed by Heiberg consisted of records of over 3,000 new-born children from the provinces and from the maternity hospital in Copenhagen. H. J. Hansen's calculations are based on data concerning some 6,000 children. The latter data were collected during ten years of his country practice as district physician. He makes a comparison between these data and others from the maternity hospital in the capital. Heiberg also treats separately the records from the provinces and from the Copenhagen institution.

Both investigators find a significant difference in the average weights of the two groups of children, the weight of the new-born in the rural districts being greater than that of the hospital infants.

He finds that the weight increases with successive births. A like result is obtained by Heiberg. The latter, after allowing for this factor, concludes that there is no correlation between the age of mother and the weight of the child at birth. Hansen's calculations, on the other hand, disclose, after a process of elimination, an influence exerted by the mother's age on the increasing weight of the successive children. But this factor he considers as of minor importance. "The weight depends much more in general on the number of previous births than on the age of the mother."

This author takes up the relation between the weight of successive children and the age of the mother at her first pregnancy, to determine whether there is an optimum period for the beginning of child-bearing. He finds that the children of mothers beginning child-bearing between the ages of 30 and 34 inclusive have the greatest average weight, exceeding those of women who enter upon maternity at an earlier or a later age. Hence, according to Hansen, "the age-group 30-34 years seems to be the optimum period for the beginning of child-bearing, judged by the standard of the weight of the later children."

A correlation between the economic condition of the mother and the weight of the new-born child is revealed in the figures from the country districts, the more favored the position of the mother is in this respect the greater is the weight of the children. But a comparison of the results from the poorest classes in the rural communities with those from the maternity hospital in Copenhagen shows a considerable difference in favor of the former.

The author then goes on to determine whether this difference may not be due to the preponderance of illegitimate children in the Copenhagen records (about 80 per cent). First he compares the weight of the legitimate and illegitimate children in his own records from the country, taking account, by successive eliminations, of three factors which might enter into the result, namely, age of mother, number of children, and economic condition. The result shows that the illegitimate children are smaller than the legitimate. Then comparing the results from the illegitimate children from the country with the material from the maternity hospital, the author finds that the country children of this group weigh more than the hospital children. This in spite of the fact that the mothers of the latter average two or three years older. "Thus," he concludes, "it is not merely the illegitimacy which reduces the weight of the children, but much more the poverty." For while the unmarried mothers in the country are as a rule poor, this is even to a greater degree true of this class in Copenhagen. Then too life in the country is on the whole more healthful than in the metropolis, a circumstance which may be presumed to have an important influence on the weight of the children.

Reference is made to the well-known folk-belief that so-called "children of love" are especially vigorous. But our Danish authority points out that if this circumstance should be investigated, the distinction should be made, not between legitimate and illegitimate children, but between those *conceived* before and those conceived in marriage. "To have this matter investigated would be of interest, but it would necessitate an extensive study of church records," he concludes.

Another point considered by Hansen is whether there is any correlation between the weight of the new-born children and the month or season of the year. He finds that the average weight is greatest in the autumn, and decreases through the winter until spring, when it reaches its minimum; then it rises through the summer, when it is about the same as in winter. This corresponds inversely to the curve for the death- and sick-rate in Denmark, which is at its maximum in March and its minimum in September and October.

Lastly, the author considers the bearing of these data on the problem of the numerical relation of the sexes. His figures indicate that the younger the mothers are at the beginning of child-bearing, the greater is the proportion of boys. No data were collected on the age of the fathers. But from other sources, it is learned that the younger the woman is at marriage, the older is the father compared with her age. Thus women under 20 marry on the average men 25.6 years of age; and at the other end of the series of diminishing differences, women 45 to 50 years old marry men of an average age of 47.4 years. This conclusion is in harmony with the Hofacker-Sadler theory that where the mother is younger than the father, more boys are born of the union, and vice versa.

The Growth of Children of School Age

Hertz, the author of the study on this subject, formerly docent in school hygiene in the University of Copenhagen, observes, "At no other age does the good or evil of the surrounding conditions make such a marked impression on the bodily structure as just in the years of childhood and growth. The development of children should be carefully followed by means of accurate measurements." In doing so a distinction should be made not only between boys and girls, town and country, different sections of the land, but also between different classes of the community.

The Anthropological Committee has made a general and systematic study of the children attending the compulsory schools, in order to determine "whether the great efforts that have been made in the last generation towards improving the conditions of school life, have resulted in any appreciable progress with regard to the bodily development of the children."

Hertz deals with the measurements made on 2,365 children attending two schools in Copenhagen. These schools represent different classes of the community; the one is a paying school, the other a free school. "With certain small reservations each may be taken as fairly representative of the class of children that would attend such schools in general. There can be no doubt that there is a considerable difference in hygienic and economic regards between the homes which send their children to the paying schools. The health is better in the latter, as also the clothing and general cleanliness. The interesting question was then to ascertain whether these conditions were reflected in the bodily measurements."

The tables for weight and height "give an unmistakable answer to the question." Comparing the children of each year between 6 and 13, Hertz finds that the children of the paying school (and this is true of both sexes), are throughout heavier and taller. The difference varies at different ages, being at a minimum at about the tenth year, for both height and weight. These phenomena the author explains on two principles, namely, "the influence of harmful conditions is most felt at the periods when development should be proceeding most rapidly, and there is a diminution in the growth-energy before puberty sets in."

A comparison is made between the children of the capital with those in some other parts of the country. It is found that the Copenhagen children have throughout the smaller measurements. This is especially significant in connection with Hansen's and Heiberg's figures for the relative weights of new-born children in the capital and the provinces, noted above. It may also be noted that S. H. A. Rambusch, in a study on the physical characteristics of school-children in some parishes in central Jutland (also published in this report), finds that the sons of farm-proprietors (gaardmænd) and of cottagers or crofters (husmænd) are at the same level in regard to height, while the daughters of the farmers are a little taller than those of the cottagers, a condition which he ascribes to the circumstance that the former are not exposed to so much work as the latter.

A further comparison is made between the present measurements and the results obtained 27 years previously. It would appear that while the boys have remained stationary, the girls have increased considerably in weight during that period.

Measurements of the chest show that the expansion increases year by year, the increase being greater for the boys than for the girls. The latter fact is referred to the lack of sufficient gymnastic exercise among the girls.

The Quality of First-born Children

Sören Hansen, in his study of this question, points out that "in most civilized countries the great decline in fertility has in recent years given rise to the fear that the supposed weakness of the first-born children may lead to a lowering of the general standard of the race." He states that "to Karl Pearson belongs the hoonr of first displaying the eugenic importance of the question."

It is well known that many distinguished men were the youngest in the family. J. F. Cooper was the eleventh child, Holberg the twelfth, Schubert the fifteenth, Franklin the seventeenth, H. C. Andersen the twenty-first, etc. On the other hand Linnaeus, Goethe, Björnson and many others were the first born; Napoleon was the second child, Balzac the third, etc. "The general opinion that the later born possess more genius or talent must be relegated, on the available evidence, to the region of fairy tales of Cinderella and the youngest son who wins the princess."

The author has analyzed the statistics furnished by the reports of an institution for feeble-minded in Copenhagen. His calculations show that the actual proportion of first-born among the feeble-minded is far in excess of that expected in a normal distribution. Pearson found a like condition among tuberculosis patients. ("A first study of the statistics of pulmonary tuberculosis," London, 1907). But Sören Hansen notes that "if this excess were due to some factor connected solely with the first birth or first conception, then the counterbalancing might be expected to begin already with the second-born, but this is not the case. The second and third children are more frequently represented among the feeble-minded than they should be, if the detrimental condition only affected the first born." Similar results from another asylum suggest that it is the earlier children and not merely the first child, which show the weakness. Weeks, in his study of epileptic patients ("The inheritance of epilepsy. Problems in eugenics." London, 1912), arrives at the same conclusion.

To test the matter more closely, Hansen examined a large material, 3,522 cases in all, dealing with patients suffering from pulmonary tuberculosis. Using the same method as in the case of the feeble-minded, *i.e.* comparing the actual number of patients with the number estimated from the general average, he finds that "not only the first-born but also the second and third are more frequently attacked by tuberculosis than they should be if their position in the family were of no importance, and this both for men and women." Pearson's investigation on the same subject, mentioned above, gave a similar result, but the material in the Danish investigation is so much more extensive.

The author concludes that "with regard to the general question, the inferiority of the first-born, more extended investigations are necessary before drawing definite conclusions, and it is desirable to know how far this possible inferiority may be counterbalanced by the many other factors which determine the racial quality. Increasing care of the children tends to diminish the dangers which have threatened the first-born more than the later and it is just this care which keeps down the mortality in families with few children. On the other hand, there is a good deal of collateral evidence for this relative inferiority. The frequency of abortion at the beginning of child-bearing, the greater number of still-born, the smaller weight on an average at birth, indicating under-nourishment, and the greater mortality during infancy point to some initial, constitutional weakness among the first-born. Nevertheless, the initial difficulties over, there is little difference in the death-rate after the fifth year between the first-born and the later children. Hence there would seem to be no reason for the inferior quality of the first-born among adults, as indicated by the greater frequency of tuberculosis, unless it be that the infection is obtained just in the early years, when the powers of resistance are not yet developed to the standard of the later children, and remains latent until a later period." This leads to the difficult question of inheritance. The author is inclined to believe that too much weight has been given this factor. A comparison of patients from consumptive and non-consumptive families shows no difference between the two so far as the relatively greater frequency of the first-born is concerned. In the words of the author, "The inferior quality of the first-born is thus a mystery and a question by itself, which is of such great importance that it deserves close attention and critical study."

Sören Hansen's study is followed by a paper by Westergaard, which is an excellent example of the use of "statistics in the service of anthropology," to quote part of its title. It is based chiefly on the data of the previous paper. The author points out that practically all statistics used in anthoropological investigation are "representative" statistics, *i.e.*, a group of observations are made which can be regarded as fairly typical and from them it is sought to discover a series of casual relations, which are then applied to related groups. Emphasis is laid on the necessity of carefully analyzing material which is taken as representative. For instance, "we may collect observations on the number of women addicted to drink in homes for inebriates. If the number is large, we may obtain interesting information regarding the characters of these and the conditions under which they lived. But we can hardly draw conclusions with regard to the whole population, nor as to the inception and relative frequency of drunkenness at different ages and so on."

With reference to the particular question at issue, Westergaard declares that even though we assume that the feeble-minded on which observations were made were representative of their class, we do not know what the relation is to the population as a whole. For we encounter the double dfficulty that we have no adequate statistics on the proportion of first-born, second, etc., in the population, and even if we do gather such statistics now, we cannot take those as typical of conditions years ago, for statistics show that the birth rate is surprisingly variable from year to year. The feeble-minded which have been studied are as a rule beyond the years of early childhood, so we cannot be satisfied with figures on new-born children. It is the survivors, and not the new-born, with whom we are concerned. Census material for a certain district in Denmark shows the number of living and dead children in families, so that the proportion among the survivors of first-born, etc., can be approximately calculated. A comparison with the data for the feeble-minded indicates that the first-born have no greater tendency to feeble-mindedness than other children.

Another consideration which should be taken into account is the number of children in the families from which the feeble-minded come. This would indicate why so many first-born feeble-minded are found in proportion to all the first-born in the population. All families with one child, who is not feeble-minded, are not included in the observations at all. If one counted the families with one child reported in the returns, and asked how many of these had a feeble-minded child, the answer of course, would be 100 per cent. Hence the preponderance of the first-born among the feeble-minded in the data. "The preponderance is only formal, not real." To quote the author, "This peculiarity in the material shows the necessity of having particular information regarding both the serial position of the subject dealt with and the size of the family." In the Danish material (3522 patients) on consumptives 988 were first-born, but of these 178 belonged to one-child families. These must be excluded if one wishes to compare the relative frequency of the first and second child; similarly, the two-children families must be excluded in comparing the second with the third, etc. A comparison on this basis shows no marked differences. "If there is any correlation between the serial number and the disease, the later children are more exposed to the danger than the intermediate, the latter slightly less than the first-born, but the conclusion is not certain." A like criticism could be made on Pearson's study of pulmonary tuberculosis.

To secure certainty in judgments on the effects of the serial number of the birth, data should be gathered on a group of families, inquiry being made concerning the condition and relationship of each individual member. Westergaard points out that this was the method used by Ansell in constructing his survival-tables. It may be added that a like method is employed and recommended by W. H. R. Rivers for the study of phenomena of relationship in ethnological research.

So on the question of the relative inferiority of the first-born child the answer on the basis of the data and criticism given by our Danish authorities must be the old verdict, "Not proven."

The Danish Anthropological Committee is to be congratulated on the important work which they are prosecuting. Not only their results, but even more their methods, are worthy of world-wide attention. Also the national government is to be complimented for initiating and supporting this survey. It presents a needed example for larger and wealthier nations. For years the Royal Anthropological Institute and other scientific bodies have appealed in vain to the British Government for the establishment of an anthropometric survey of the United Kingdom. In the United States such a national undertaking is presumably such a far-off event that as far as known no one has yet even asked for it. It is not the first time that the little kingdom of Denmark has led the advance in scientific research. European prehistoric archæology, that great and rich branch of anthropology, dates, as a scientific study, from the establishment of a Danish royal commission in the early years of the nineteenth century. In the first decade of the twentieth century Denmark has taken the lead in establishing a national survey in physical anthropology.

A REPORT OF THE BUFFALO CONFERENCE ON THE BINET-SIMON TESTS OF INTELLIGENCE

By Lewis M. Terman

In connection with the Fourth International Congress on School Hygiene, which met at Buffalo, August 25-30, 1913, a special conference was arranged for the consideration of the Binet-Simon tests of intelligence. The topics discussed included criticisms of the scale, suggestions as to methods of revision, extension or amplification, the interpretation of results secured by its use, illustrations of its value in psychological research, etc. All persons in this country who were known to have made any extensive trial of the scale were invited to participate, of whom all but three or four were able to do so. Ten papers were presented, including one from Dr. Otto Bobertag, in Germany. The following brief abstract of these papers may be of interest to the readers of the Pedagogical Seminary.[1]

Some Limitations of the Tests, by Charles S. Berry, of the University of Michigan.

In criticising the tests it is necessary to bear in mind the purpose for which they were designed; that it is not their aim to test all aspects of intelligence, but only general intelligence; that they are not calculated to bring to light emotional or volitional peculiarities, except incidentally; and that Binet never thought of them as a method of complete mental diagnosis.

By "intelligence," Binet means especially judgment, power of comprehension and reasoning. He does not claim that these can be tested without the results being influenced to some extent by differences of environment and training, but he does not tell us definitely enough how to make allowance for such influences.

The scale is defective and imperfect beyond 11 years, so that mental growth beyond age 10 is inaccurately measured. Trial of the 15 year tests on 68 college seniors showed that only three students were able to pass all the tests of this group, and only 53% three or more.

A committee should be appointed to standardize the scale as regards both the choice of tests and the procedure for each individual test. To such a committee should also be entrusted the task of revising the scale each year in the light of new investigations.

The Degree of Mental Deficiency as Expressed by the Relation of Age to Mental Age, by F. Kuhlmann, psychologist at the State School for Feeble-Minded at Faribault, Minnesota.

Mental development, like brain growth, proceeds at a constantly decreasing rate. There is much less difference, for example, between eleven and twelve year intelligence than between one and two year intelligence. The year is therefore not a stable unit for defining the degree of retardation. A still more fatal objection to the use of the year standard for defining intellectual status is the fact that mental growth takes place at a slower rate with feeble-minded than with normal children. For both of these reasons combined, it comes about that a retardation of one year in early childhood may amount to several years of retardation by the age of fifteen.

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[1] In the following abstracts no effort is made to follow the language of the papers reported.

The proposal of Stern to express intellectual status by the ratio between mental age and real age (the so-called *intelligence quotient*) avoids a part, but not all, of this error. The intelligence quotient would be a true index only (a) if the rate of development for normal and feeble-minded children were the same; and (b) if it continued as late in the feeble-minded as in the normal. It is probable that (a) introduces an error of some importance, while as regards (b) it is necessary to await evidence.

In order to throw light on the reliability of the intelligence quotient, the data from 1,006 feeble-minded children were tabulated in such a way as to make possible a comparison between the average mental ages calculated by the intelligence quotient. The results showed a very close resemblance. It appears, therefore, that the error incurred by the use of the intelligence quotient is not large.

Current Misconceptions in Regard to the Functions of Binet Testing and of Amateur Psychological Testers, by J. E. W. Wallin, University of Pittsburg.

Four misconceptions were pointed out, as follows:

Misconception 1, that intelligence tests constitute a complete mental examination. Instead, they are useful only for a preliminary survey. They do not give a differential diagnosis, locate causes, or forecast the outcome.

Misconception 2, that a brief course in mental testing will make a competent clinical psychologist. Prolonged special training is necessary, and this must be built upon a solid foundation of psychological scholarship.

Misconception 3, that the Binet-Simon scale is absolutely accurate. There are some cases in which it gives a misleading report. To rely upon it as an infallible method leads to an exaggeration of the amount of feeble-mindedness which exists.

Misconception 4, that norms for the revision of the scale can be secured by random testing and by haphazard procedure.

The Use of the Binet-Simon Scale with Delinquent Children, by Grace M. Fernald, State Normal School, Los Angeles, California.

The scale grades fairly accurately the intelligence of school children from 6 to 12 years, but it does not apply equally well to some of the street waifs of our large cities because the experience and standards of achievement of such children are almost entirely different from those of ordinary children. The usefulness of the scale for juvenile court cases is impaired for this reason, since about 80 per cent of these cases (in Chicago, at least) come from homes more or less broken up. Their intelligence has been molded by the life of the street, which demands action based on practical judgment rather than abstraction or nicety of verbal distinction.

Too many of the Binet tests depend upon language. This is especially disturbing in the case of children who have had no opportunity to acquire a command of the language in which the test is given. Instances were found in the Juvenile Psycho-pathic Institute of Chicago of children from immigrant families who tested retarded by the Binet scale, but who later proved themselves capable of making excellent school progress. The scale should include more motor and game tests.

The tests are so unsatisfactory in the upper age groups that an eighteen-year-old perfectly normal subject might easily grade six years retarded.

A Comparison of White and Colored Children Measured by the Binet-Simon Scale, by Josiah Morse, University of South Carolina.

123 colored and 225 white children of corresponding ages were tested by Goddard's revision. The two groups had had equal school advantages. The tabulation of mental ages shows a decided superiority of the white children as follows:

	Colored	White
Retarded more than one year..................	29.4	10.2
Satisfactory.	69.8	84.4
Advanced more than one year..................	.8	5.3

To make the comparison a fairer one, the white children were divided into two groups according to social class and the white children of the poorer class (mill children) were then compared with the colored. The latter were still inferior, the mill children standing about half way between the colored children on the one hand and the well-to-do white children on the other.

When the colored children were classified according to color, a *direct* correlation was found between average mental age and darkness of color. On the other hand the lightest group showed the greatest range of variation, containing a larger proportion of both retarded and advanced than any other colored group.

The colored children were, on the whole, superior in counting, memory for digits, naming words, finding rhymes, defining terms, and in time orientation. They were inferior in aesthetic judgment, observation, reasoning, use of words, logical memory and resistance to suggestion.

"Possibly in the Binet scale a method has been found which will prove of the greatest service in the solution of problems in contemporary folk-psychology and race and social adjustment."

The Value to be Derived from Giving Mental Tests to all School Children, by W. H. Pyle, University of Missouri.

The author's experiments with mass tests given to several thousand school children prove that it is possible to grade the intelligence of school children in this way with a fair degree of accuracy. Such tests, however, can only be used from the second grade up, and are not meant to replace entirely the method of individual testing. They will prove of value in enabling the teacher to make a rapid preliminary survey of the intelligence of her pupils and will disclose the need of further tests in individual cases.

Suitable for this purpose are tests of logical and rote memory, tests of imagination, association and linguistic invention, the cancellation and substitution tests, etc.

In addition to grading intelligence, such tests will also supply the teacher with valuable information regarding the individual differences of children with respect to various mental functions.

The Reliability of the Binet-Simon Measuring Scale of Intelligence, by H. H. Goddard, Vineland, New Jersey.

There are two ways of judging the reliability of a scientific method: (a) from apriori considerations and (b) from empirical data. The two methods do not always agree. Some have said that intelligence can not be measured by the Binet scale, while as a matter of fact it is constantly being measured by this method, and with success. The scale was not intended, however, to reveal fine differences of intelligence amounting to small fractions of a year.

There is nothing in the scale itself to give us a criterion of feeblemindedness. Only data derived from the history of cases subsequent to testing will determine the amount of mental retardation necessary to constitute deficiency.

Only persons trained in the use of the tests can secure reliable results, though anyone with intelligence who is willing to study the directions with care can secure results of value to himself. Important action should in all cases await a more expert diagnosis.

The experiment of having several different persons grade the same children proves that the results of trained testers agree almost perfectly, those of untrained testers not so well.

It is nowhere claimed that the Binet tests render further study of the case unnecessary. All the supplementary information it is possible to secure must be utilized in every case. It sometimes happens that a child will test retarded who is a normal pupil, but this is very rare.

The doctrine of probability would lead us to expect that according to the method by which the individual tests of the Binet scale are located (i.e., on basis of 75 per cent of normal children passing), about one child in 1,000 who fails in all the tests for his age group would nevertheless be of the mental age represented by that group. Since many of the tests are located on the basis of a larger per cent than three-fourths passing, the actual danger of grading a given child more than one year below his true mental age becomes practically negligible.

Some Requirements of Graded Mental Tests, by Carrie R. Squire.

The Binet scale is useful, but as it stands it is imperfect and limited. The tests are heterogeneous and little comparable in the different ages. This acts to obscure the laws of mental growth.

To show how mental growth proceeds we should have a number of serial graded tests, each of which would test a given function at several different levels. Several of the Binet tests are suitable for such arrangement, including memory for sentences and digits, comparison of weights, the drawing tests, interpretation of pictures, piecing together of forms, etc. Several graded tests should be chosen which will test a variety of different functions, but a large number of such series is not necessary for grading intelligence. The tests should resemble those of Binet in type, not the rigid experiments of the psychological laboratory.

Some Theses Regarding Methods of Using the Binet-Simon Scale, by Dr. Otto Bobertag, Breslau, Germany.

Dr. Bobertag's paper was brief, but touched upon a number of fundamental sources of error on the use of the scale and on the methods of securing data for its revision. It warned especially against placing reliance upon the results of untrained examiners, using the tests in a mechanical way, injecting unintentional variations into the procedure, et cetera. Dr. Bobertag's criticisms are the fruit of several years of careful research with the tests.

Suggestions for Revising, Extending and Supplementing the Binet Intelligence Tests, by Lewis M. Terman, Stanford University.

In securing children for the purpose of revising the scale every kind of "selection" is to be avoided as nearly as possible. An attempt to eliminate from the experiment all except the "normal" children necessarily introduces the possibility of error. It is merely necessary to choose a school population of average quality and to test all the pupils, excepting, of course, the deaf and those who do not know the language, etc. Revisions can not safely be based on statistics derived solely from feeble-minded cases.

Much confusion exists as to the percentage of passes which should guide us in locating a given test. The search for any given per cent is beside the point. On the present plan of the scale (tests by year units), the proportion of passes necessary to place a test properly at the lower end is well above 75 per cent, while at the upper end the number is below 75 per cent. This is due to the decreasing rate of growth in the upper years, which makes the scale coarse at the lower end and finer (in size of unit of measure) at the upper end. If the unit were uniform, and sufficiently fine, slightly over 50 per cent of passes would locate a test properly.

It is not necessary, as some have claimed, to keep the number of tests in the different age groups equal. If they are to be made equal, six would be a better number than five.

No revision yet made has placed all the tests in the group where they belong. Some of the tests, also, should be replaced by better ones already in existence. The following are important criteria in the choice of tests for this purpose:

1. They should bring as nearly as possible the same factors into play in all children.
2. They should be little subject to the influence of the personal equation in grading.
3. They should be usable.
4. They should test intelligence, not training.
5. They should fit *accurately* the age where they are to be placed.

The following new scales would be of great value for practical purposes:

a). A new scale on the order of the Binet scale to be used interchangeably with it.
b). A scale suitable for mass tests, for preliminary surveys.
c). A scale made up of graded serial tests like those recommended by Miss Squire.
d). A rough pedagogical scale which could be applied at one sitting.

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The writer of this report prepared papers dealing with other aspects of the Binet scale for two other sections of the Buffalo Congress, and a brief resume of these may be added to the above account.

Psychological Principles Underlying the Binet-Simon Scale and Some Practical Considerations for its Correct Use. (For the Conference on the Education of Backward, Truant, Delinquent and Dependent Children.)

The Binet tests differ from the earlier tests of intelligence in three important respects: (1) they represent the first serious attempt to form a graded scale of tests, and this feature is one of the main reasons for their success. (2) They aim at the higher intellectual processes directly, instead of trying to measure intelligence indirectly through tests of the elementary mental processes. (3) The Binet tests are practically the first to break loose from the influence of the "faculty" psychology. Instead of measuring separate functions, Binet undertook merely to ascertain the level of *general intelligence.*

In order to give a fair criticism of the tests it must be remembered that they are subject to certain avowed limitations. They make no pretense of exploring the entire mentality of the child, or even his special lines of intellectual ability (special talents).

For determining approximately the grade of general intelligence the scale is unquestionably reliable in the main, at least for the years 3 to 12. This is admitted by everyone who has made any serious study of the scale. The minor imperfections are well known. Abelson and Kuhlmann have proved conclusively the great superiority of such tests over the teacher's judgment as a means of determining intelligence; Goddard has shown the close correlation between the Binet results with the feeble-minded and industrial efficiency; and Bobertag finds that the results of the tests, statistically treated, are such as would satisfy the (theoretical) requirements of a fairly accurate scale.

Special sources of error which merit further attention include such matters as the part played by chance in some of the responses, the lack of exact and impersonal methods of scoring, lack of uniformity of procedure, momentary physical or mental indisposition of the child, the use of the tests by untrained examiners, etc.

The Significance of Intelligence Tests for Mental Hygiene. (For the section devoted to mental hygiene.)

Mental hygiene must be based largely on the findings of differential psychology, and it is in the measuring of intelligence that differential psychology has met its greatest success. The rehabilitation of mental tests is one of the most significant of all recent developments in psychology. Intelligence tests have at least the following points of contact with mental hygiene:

1. By aiding us to identify the feeble-minded and to determine accurately the level of their mental powers they enable us to choose the methods and matter of education which will guarantee for such children the best possible returns for their efforts. This is an essential condition of their volitional and moral training.

2. Intelligence tests also emphasize the individual differences present among normal children and they are doing much to loosen up the current systems of school classification. Mental hygiene, for the bright as well as for the dull, demands that school requirements be apportioned according to the ability of the learner.

3. The segregation of the feeble-minded, which is sure to follow the further use of intelligence tests, will, besides aiding in the elimination of degeneracy, remove a demoralizing and retrograding influence from the lives of many normal children. Reference is here made to those who are compelled to associate with the feeble-minded either in the home or the school.

4. Mental health, as is well known, depends intimately upon opportunities for appropriate self-expression in work. To insure this, vocational guidance of youth is necessary; and vocational guidance must be based to no small degree upon measurements of intelligence. All the important occupations will need to be graded and classified with respect to their demands upon general intelligence.

5. Intelligence tests afford us the first means we have yet had of determining accurately the influence upon mental capacity of such important matters as ventilation, sleep, adenoids, malnutrition, or other conditions of physical defectiveness.

6. Intelligence tests could in part replace the other systems of school examinations in determining fitness for promotion. As Graziani, Helwig and others have shown, the latter sometimes produce grave injury to nutrition and to nervous health generally.

* * * * * * * * * * *

There were other papers at the congress which dealt in one way or another with intelligence tests, and a public clinic was conducted by Dr. Wallin throughout the week for the demonstration of the Binet-Simon scale. Besides the official conference above reported, Professor Whipple called a special meeting of Binet workers for the sake of discussing more informally the problems relating to revision of the scale.

If, as we may confidently believe, the Binet-Simon scale will become when amplified, corrected and standardized, a tool of first importance in the conduct of psychological and educational researches, the attention it received at this congress was fully warranted.

BOOK NOTES

Fundamentals of farming and farm life. By Edwin Jackson Kyle and Alexander Caswell Ellis. New York, Scribner, 1912. pp. 557.

The authors find the defects of previous text-books on agriculture in the fact that they are usually prepared by busy scientists who know agriculture but not the mental processes of children and have had no experience in teaching them or in knowing the exact conditions in the schools where the texts are to be used, so that subject matter has not always been wisely chosen in the light of children's natural interests or needs, nor organized pedagogically by passing from the known to the unknown. This work, illustrated by 282 cuts in its 24 chapters, with half a dozen appendices, treats such subjects as plant growth, how plants are reproduced, the soil, fertilization, rotation, implements, farm crops, garden, school garden, farm, fruit growing, plant enemies, animal husbandry, care of milk products, horses, sheep, hogs, poultry, care and feeding of animals, farm planning and accounting, farm home and school, grounds and preparation, use of foods, sewing, self-improvement of teachers, rain-fall, school library, roads, boy corn clubs. It will be evident from this range of topics that the book is practical and takes its subject very close to the life of the child. So much has been written on this subject of late years that the undertaking of these authors was a bold one, but they realized that they must write the best as they were writing the last, and in the reviewer's opinion they have succeeded in doing so.

Uber das Seelenleben des Kindes. Von Adolf Dyroff. 2nd rev. and enl. ed. Bonn, Peter Hanstein, 1911. pp. 211.

After a little history of studies of the child's development as a whole, the author discusses the development of knowledge, with sections on each sense, memory, fancy, thought. He then takes up "*Das Streben des Kindes,*" discussing reflexes, feelings, instincts, valuations, feelings of knowledge, religious sentiments, suggestibility and will, summarizing in a general way the chief results of these studies. In the second part he discusses developments in special lines, art, drawing, music, poetry, the ego, interest, etc., with appendices on pedagogic results of child psychology and its methods and worth. It is a useful book but moves by far too much in the realm of philosophical categories. The author gives almost no evidence of knowledge of the copious American literature upon the subject and his philosophical proclivities make him gravitate toward speculative problems, a tendency which is by no means compensated by the abstract general attempts to apply child study data to education. The reader of this book must reluctantly admit that the author adds nothing to his subject and that those who get their first impression of this field from reading it will think it a somewhat arid and profitless domain of study.

Psychopathology of hysteria. By Charles D. Fox. Boston, Richard G. Badger (1913). pp. 437.

The main topics in this book are etiology, disturbances of sensory perception, visceral and circulatory derangements, psycho-motor disorders, psycholepsy, alterations of consciousness, multiple personality and amnesia hysteric temperament, suggestibility, delusions, insanity, theories, diagnosis, prognosis and treatment. In looking at a work on this subject now the first test would be to see how far the writer has understood and come to terms with Janet and his French associates, and the far more important group of Freudians. Unfortunately although he refers in terms of hearty commendation to Freud in his preface, it is evident that the author is not well acquainted at first hand with the Freudian literature, and such references as he gives are only those of English works. We look in vain for even the names of Dejerine, Dubois, Marcinowski, Adler, Stekel, etc. Thus this book must be set down as one of many meritorious ones mainly based upon wide experience of the very sensible and intelligent physician who has put down the things that have impressed him in his own practice and rather limited reading.

Hypnotism and disease; a plea for rational psychotherapy. By Hugh Crichton Miller. London, T. Fisher Unwin, 1912. pp. 252.

The author attempts to present the main features of psychotherapy in a form suitable for intelligent lay readers of either sex, and so in his chapters discusses the interaction of mind and body, history of hypnotism, phenomena of hypnosis, psychological aspects, methods, who can hypnotise and who can be hypnotised, psychoneuroses, treatment of organic diseases, diseases of lost inhibition, with several appendices on insomnia, legal aspects, objections, conclusions, bibliography. It is a book of limited range and to our thinking not up to date. The author has very little to say and apparently knows little of modern psychoanalysis and has not at all grasped Dejerine's method, and we do not find evidence that he has ever heard of Marcinowski, so that while the book may be of service to amateurs, it seems to the present writer to be the work of only a somewhat more advanced one.

Inductive versus deductive methods of teaching: an experimental research. By W. H. Winch. Baltimore, Warwick & York, 1913. pp. 146.

Mr. Winch certainly does, as the preface says, write with the authority of long experience as an official inspector of English schools. He brings the technique of experimental and statistical methods to bear upon the practical problems of the school. This book claims to be the first attempt to decide between the conflicting claims of inductive and deductive methods by experimental procedure. It is an attempt to decide between the two methods by testing children on precisely what they had been taught or had learned.

Backward and feeble-minded children. By Edmund Burke Huey. Baltimore, Warwick & York, 1912. pp. 221.

The author here prints the results of his own long and careful study of the subject, treating classification and terminology, clinical studies of border cases, translation of data, suggested groups, lines of transition from feeble-mindedness to non-feeble-mindedness, a syllabus for clinical examination of children, with a final chapter on mental functions to be tested and observed. The work bears all the marks of the characteristic thoroughness and conscientiousness of the writer, is of unique value, and should be in the hands of everybody interested in the subject.

How I kept my baby well. By Anna G. Noyes. Baltimore, Warwick & York, 1913. pp. 193.

The value of this work, which will interest physicians, nurses, and parents, consists in the fact that it points the way to a method and type of observation that any intelligent mother can undertake with profit to herself and others and thus disprove the contention of some critics of child study that observation of young mothers on their own children can never yield data of value. It also furnishes generalizations in the shape of principles and rules governing feeding, clothing, etc. It has many interesting illustrations.

Sterilisation und Kastration als Hilfsmittel im Kampfe gegen das Verbrechen. Von Friedr. Ludw. Gerngross. München, J. F. Lehmann, 1913. pp. 42.

The writer first gives earlier efforts to prevent the increase of the worst elements of the human race, then discusses the limitations of subnormality in propagation, with a review of American laws, and grounds for and against the methods they advocate. He then discusses the problem of consent on the part of the victim of the operation and its medical aspects from the standpoint de lege lata and de lege ferenda. Two pages of literary references are appended.

Education for social efficiency; a study in the social relations of education. By Irving King. New York, D. Appleton & Co. (1913). pp. 311.

In writing this book the author has had in mind not so much the interests of educational specialists as the practical needs of busy teachers and parents. He attempts to present, largely by the method of illustration, a social view of education which is coming more and more to prevail. It is an excellent presentation of the present state of the problem.

The meaning of evolution. By Samuel Christian Schmucker. New York, Macmillan, 1913. pp. 298.

This is a charming if somewhat popular account of evolution in a large way, first before Darwin, then what he and Wallace accomplished, the basal idea, individual adaptation, adaptation for the species, life in the past, the development of mammals, of the horse, evolution since Darwin, and the future evolution of man.

Dusty air and ill health; a study of prevalent ill health and causes. By Robert Hessler. Printed privately, 1912. pp. 352.

The writer, after an introductory chapter, discusses local conditions and changes in time, dust and its victims, cold and catarrh, dyspepsia, nervous prostration, circulatory and kidney troubles, specific diseases, biography and ill health. It is an interesting and instructive book.

Über Sexuelle Gewohnheiten; ihre Ursachen, Folgen und wirksame Bekämpfung durch neue Kuren. Von K. Puster. Zweite Auflage. Leipzig, F. W. Gloeckner & Co., n. d. pp. 132.

The author first describes the extent and causes of sexual irregularity and methods adopted to prevent it, then discusses the errors that have been so prevalent in regard to the results of onanism and contrasts these with the real consequences of it. Another chapter is devoted to recognition and cure of onanism, and of its results, and the final chapter is devoted to sex training and education and methods of avoiding error.

Spelling ability; its measurement and distribution. By B. R. Buckingham. New York, Teachers College, Columbia University, 1913. pp. 116.

In this interesting monograph the main topics are the discussion of lists, original, selected, preferred, etc., and then the examination, conclusions regarding them, the ratings of individual pupils, overlapping, location of grade medians, use of the scale, the zeropoint in spelling ability, supplementary testing, etc.

Études de psychologie. Publiées par A. Michotte. Vol. 1, Fasc. 1, Mars, 1912. Paris, Félix Alcan. pp. 233.

This volume consists of three papers by Michotte himself, contributions to the study of logical memory, new researches on simultaneously appearing impressions of periodicity, and finally a note on recent contributions to the psychology of the will.

When great folks were little folks. By Dorothy Donnell Calhoun. New York, Macmillan, 1913. pp. 174.

A very simple story of the childhood and youth of fourteen eminent people. The writer has recognized the value and charm of biography.

Practice in the case of school children. By Thomas Joseph Kirby, New York, Teachers College, Columbia University, 1913. pp. 98.

The author first takes up the administration of the experiments, then improvement in the group as a whole, then the effect of distribution and length of work period upon the rate of learning, the permanence of the practice effect.

The school drama, including Palsgrave's Introduction to Acolastus. By James L. McConaughy. New York, Teachers College, Columbia University, 1913. pp. 116.

After discussing the school drama in general the writer characterizes it in England, the Elizabethan drama, the school drama in Germany, the Jesuit school drama, and Acolastus.

Der Fall Gogol. Von Otto Kaus. München, Ernst Reinhardt, 1912. (Schriften des Vereins für freie psychoanalytische Forschung, No. 2.)

Die Psychologie im Kampf ums Dasein. Von Wilhelm Wundt. Zweite Auflage. Leipzig, Alfred Kröner, 1913. pp. 38.

The secret of Herbart; an essay on the science of education. By F. H. Hayward. Revised and enlarged. London, Watts & Co., 1907. pp. 80.

Exceptional children in the public schools of New Orleans. A report of the Committee of The Public School Alliance, March, 1913. Pub. by The Public School Alliance of New Orleans, 1913. pp. 36.

Report on the progress and condition of the United States National Museum for the Year ending June 30, 1912. Washington, Government Printing Office, 1913. pp. 165.

Current educational activities; a report upon education throughout the world, being the 1911 volume of "The annals of educational progress." By John Palmer Garber. Philadelphia, Lippincott, 1912. pp. 387.

The life and public services of Andrew Haswell Green. By John Foord. New York, Doubleday, Page & Co., 1913. pp. 322.

Sixth biennial report of the Colorado State Bureau of Child and Animal Protection, December 1, 1910, to November 30, 1912. Denver, Colo., Smith-Brooks Printing Co., 1913. pp. 105.

Guide book to childhood; a hand book for members of the American Institute of Child Life. Prepared by William Byron Forbush. Philadelphia, American Institute of Child Life (1913). pp. 236.

The little window. By Helen Merrill Hodsdon. New York, T. Y. Crowell Co. (1913). pp. 87.

Training for efficiency. By Orison Swett Marden. New York, T. Y Crowell Co. (1913). pp. 360.

A brief Shaksperean glossary, grammar, and booklet of other information necessary to students. By Robert Huntington Fletcher. Grinnell, Iowa, 1913. pp. 90. (Cedar Rapids, Iowa, Torch Press.)

Tennyson and Browning; a manual for college classes and other students. By Robert Huntington Fletcher. Cedar Rapids, Iowa, Torch Press, 1913. pp. 258.

The pupils' arithmetic, Book Five. By James C. Byrnes, Julia Richman, John S. Roberts. New York, Macmillan, 1913. pp. 267.

Trigonometry. By Alfred M. Kenyon and Louis Ingold. Edited by Earle R. Hedrick. New York, Macmillan, 1913. pp. 124.

Report of the Commissioner of Education for the year ending June 30, 1912. Washington, Government Printing Office, 1913. Vols. 1 and 2.

Practical Physics for Secondary Schools. Fundamental principles and application to daily life. By N. Henry Black and Harvey N. Davis. New York, Macmillan Co., 1913. pp. 487.

The message of Greek art. (Chautauqua Home Reading Series.) By H. H. Powers. New York, The Chautauqua Press, 1913. pp. 340.

Studies in the poetry of Italy. I, Roman. By Frank Justus Miller. *II, Italian.* By Oscar Kuhns. (Chautauqua Home Reading Series.) New York, Chautauqua Press, 1913. pp. 348.

Rambles and studies in Greece. (Chautauqua Home Reading Series.) By J. P. Mahaffy. New York, The Chautauqua Press, 1913. pp. 459.

Stories of childhood and nature. By Elizabeth V. Brown. Yonkers-on-Hudson, World Book Company, 1913. pp. 223.

Stories of woods and fields. By Elizabeth V. Brown. Yonkers-on-Hudson, World Book Company, 1913. pp. 192.

Barbara's Philippine Journey. By Frances Williston Burks. Yonkers-on-Hudson, World Book Company, 1913. pp. 199.

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